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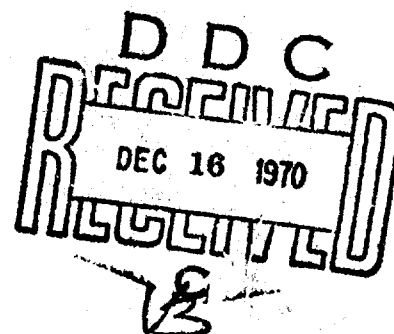
STUDY TO DETERMINE THE OPERATIONAL PROFILE AND MISSION OF THE CERTIFICATED INSTRUMENT RATED PRIVATE AND COMMERCIAL PILOT

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FINAL REPORT**



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16. Abstract <p>The results of a survey to produce information on the operational profile and mission of the instrument rated private and commercial pilot are reported.</p> <p>Based upon an analysis of the data produced by the survey, two operational flight profiles were developed: the most difficult and complex operation, and the medium operation. The profiles were then analyzed to determine those aeronautical skills and knowledge required to operate within each profile.</p> <p>The implications of this study are directed toward providing knowledge useful in designing an instrument rating certification program based upon a standard of operational competence. The data will also be useful in other research relating to the activities of the instrument rated private and commercial pilot.</p>			
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I. INTRODUCTION

The active certificated instrument rated private and commercial pilot represents a fast growing category of the nation's airmen. The Federal Aviation Administration is charged with the responsibility of regulating airman certification.

The purpose of the proposed study is to determine the operational profile and mission of the certificated instrument rated private and commercial pilot. This study is the first phase of a Federal Aviation Administration effort which has as its objective the feasibility of training pilots to a standard of operational competence as a criterion for instrument rating certification.

In recent years, the population of active private and commercial pilots has experienced rapid growth, from 228,773 in 1960 to 476,076 in 1969, an increase of 108% over a nine year period, or a compound annual growth rate of 8½%. Over the same period, instrument ratings held by this category of pilots increased more rapidly, from about 44,985 to 123,493, an increase of 175%, or a compound annual growth rate of 12%. Commercial pilots account for about 91% of the instrument ratings held by active private and commercial pilots. General aviation, the industry which serves this category of pilots, has also demonstrated rapid growth in recent years with an accompanying increase in the sophistication of both aircraft and equipment. Further, the airspace regulatory environment in which the pilot must operate is continually evolving, placing increased demands upon his operational competence.

Knowledge of how the instrument rated pilot conducts instrument flights (operational profile) and the purposes for which he uses his aircraft during instrument flights (mission) is requisite to an effective, contemporary, fair, and adequate instrument rating certification program. Such information heretofore has been limited in scope and almost nonexistent. This study to determine the operational profile and mission of the certificated instrument rated private and commercial pilot was conducted to provide information useful in designing an instrument rating certification program based upon a standard of operational competence.

The objectives of the study are provided by the contractual statement of work:

1. Conduct a survey, statistically reliable, of the instrument rated private and commercial pilot.
2. Use a mail questionnaire approach of such scope as to produce information from which there can be developed an operational flight profile and mission of the instrument rated pilot.
3. From the information gained in the survey, develop two operational flight profiles depicting:
 - (a) the most difficult and complex operation.
 - (b) the medium operation.
4. Analyze the two profiles to determine those aeronautical skills and knowledge required to conduct safely such missions and profiles in today's air traffic control environment.

II. THE GENERAL AVIATION IFR OPERATION

The instrument pilot survey has produced information from which a description of the "typical" general aviation instrument rated pilot and his flight operation has been developed. It is based upon an inspection of the general aviation IFR data (Appendix C) and a determination of the median response for continuous data, the mode response for discrete choice data, and the more than 50% response for "as applicable" discrete data. The determination was made after subtracting the ambiguous and no response answers. The term "typical" is meant to indicate that the sample is representative of the population of instrument rated private and commercial pilots, within the limits of statistical confidence and uncertainty discussed in Sections IV and V. The information is presented in the order in which it appears on the questionnaire. Each numbered item below corresponds to the number of the question as it appears on the questionnaire (Appendix B).

1. He flies a complex (having retractable gear and controllable propeller) single or multiengine aircraft, produced since 1965, having a cruise speed of 150-159 knots, and an approach speed of 100-109 knots.
2. His aircraft has two 360 channel transceivers, two VOR/LOC receivers, at least one glide slope receiver, ADF and marker beacon receivers, and a transponder. It is equipped with pitot heat and an autopilot with at least a roll capability.
3. His aircraft is most likely to be company owned.
4. He had much to say about the selection of the aircraft.
5. He received his private and commercial pilot certificates during the 1960's, and his instrument rating since 1965.
6. He received his instrument rating on the basis of completing required FAA tests and experience. He is not a graduate of an approved flying school.

7. He is single and multiengine rated.
8. He has at least 2000 hours total time, with at least 250 hours in the last twelve months.
9. He flies about once per week, on an IFR flight plan about every other week.
10. He is current on instruments, having logged at least 25 hours instrument in the last twelve months. He has at least 140 hours total instrument time logged, at least 60 of which are actual instrument in an airplane.
11. He has been a pilot in command in actual instrument weather conditions in the last six months.
12. His last instrument dual instruction or instrument flying evaluation ride was last year (1969).
13. During training for an instrument rating, he visited an air traffic control tower and an approach/departure control facility.
14. He considers 10 hours of actual instrument time worthwhile during training for the instrument rating.
15. Data in Question 15 reflects the distribution of responses by state.
16. He originates his IFR flights from an airport which has an ILS or a VOR approach.
17. He has most often made ILS approaches in the last twelve months.
18. During the last twelve months, he has most frequently flown for business (not for hire) or personal reasons.

19. He subscribes to LCC & GS flight information publications, which are usually current.
20. He has had no need to cancel an IFR flight during the last 12 months. If he has, it was because of weather beyond his aircraft/equipment capability.
21. He tends to use the published minimums on instrument approaches as his personal minimums.
22. He will probably go on an IFR flight if light icing or scattered thunderstorms are reported anywhere enroute. He probably will not go if heavy ground fog is reported.
23. He will usually file IFR if his destination weather is forecast to be ceiling 5000 feet or less, visibility 5 miles or less.
24. He seldom or never cancels an IFR flight plan upon reaching VFR conditions after departing an airport in IFR weather.
25. He seldom or never files an IFR flight plan before departing on a flight to be conducted entirely in the daytime in good VFR conditions.
26. He seldom or never files an IFR flight plan in flight.
27. 20 - 24% of his time on instrument flight plans is in actual instrument conditions.
28. He has made an ILS approach in actual instrument conditions during the last twelve months.
29. He operates IFR most often within a radius of 400 nm of his home airport.

30. The one way distance of his longest non-stop IFR flight during the last 12 months was 500 nm or less.
31. During the last 12 months, he has been rerouted or had to hold no more than twice and has not had to execute a missed approach or divert to an alternate.
32. He rates ILS, LOC, and VOR approaches as having little difficulty, ADF approaches as having some difficulty.
33. He almost never receives assistance from someone during an IFR flight. When he does receive assistance, it is from another instrument rated pilot who is not a required copilot.
34. He has flown in a single engine aircraft in IFR, night VFR, and night actual IFR conditions.
35. He considers the six hours of instrument experience within the preceding 6 calendar months adequate in maintaining a safe level of instrument proficiency.
36. He considers himself at or just below the level of a professional pilot in aeronautical skill, knowledge, and experience.
37. He experiences little or some difficulty, but not much or extreme, in conducting IFR flights during departure, transition, and approach phases.
38. He believes heading control to be the aspect of flying performance to deteriorate first as a "normal" IFR flight becomes more difficult because of IFR conditions.
39. He believes the reason for his flying performance deterioration mentioned in the previous question to be caused by lack of recent instrument flying experience.

40. He believes the most common errors made by instrument pilots are:
- (1) not knowing personal limitations.
 - (2) not planning ahead.
 - (3) allowing skills to deteriorate.
41. He would like to see a requirement for actual instrument experience made a part of the training and regulations concerning the certification of new instrument pilots.
42. He mentions structural icing or thunderstorms as his most uncomfortable or threatening experience during an IFR flight in actual IFR conditions.

III. SURVEY DESIGN

The principal elements in the survey design process were:

1. Review Survey Research
2. Perform Task Description and Mission Analysis
3. Design Questionnaire
4. Conduct Questionnaire Pretest
5. Develop Survey Mailing Procedure

The term "survey" means the entire process of gathering information about a large number of people. The term "questionnaire" refers to the survey instrument, the form on which the information is gathered.

Survey Research

In order to assure that the survey was designed and conducted according to the principles of survey research, selected references were reviewed early in the study (see Appendix A). A survey design reference manual was prepared which summarized the key points obtained from the review. The manual was referred to during the design of the survey.

Of particular concern throughout the survey design process was to assure that the reliability and validity of the mail questionnaire was maximized. The way in which the reliability and validity of a mail questionnaire is provided for is not as dependent on pure statistical considerations as it is on the manner in which the survey is designed. In conducting the instrument pilot survey, due consideration was given to the ways in which to increase the reliability and validity of the mail questionnaire, as shown in Table 1.

Task Description and Mission Analysis

To provide a basis upon which relevant questions could be developed, a brief task description and a mission analysis were performed. Actual flights were conducted in the IFR environment and IFR communications tapes were analyzed to provide an operational background against which to perform the task description.

TABLE 1

WAYS IN WHICH TO INCREASE THE RELIABILITY AND VALIDITY
OF THE MAIL QUESTIONNAIRE

1. Assure anonymity of response.
2. Minimize non-response.
3. Adequacy of questionnaire construction, i.e. question design, content, grouping, layout, etc.
4. Proper questionnaire length (approximately one-half hour maximum).
5. Proper statement of the problem in the cover letter and design of cover letter to encourage response.
6. Use of closed (structured) questions instead of open ended (unstructured) questions to keep questionnaire to a reasonable length and encourage response.
7. Selection of a worthwhile topic.
8. Choice of a population for whom the topic has interest and psychological meaning.
9. Conduct a follow-up mailing.
10. Mechanical considerations: neatness, ease of returning questionnaire, use of postage stamps instead of prepaid postage, timing.
11. Provision of an incentive.
12. Wide coverage which promotes the selection of a larger and more representative sample.

A task description characterizes the interactions of the pilot, his aircraft, and the system environment. The conceptual model presented in Chapter VI summarizes the task description. Once it was known what instrument pilots do in the system, derived from the questionnaire data and presented in the operational profiles, a determination of what human capabilities are necessary was made. By this is meant that inferences were made, based upon an analysis of the profiles, concerning the kind of skill and knowledge required to conduct instrument flights safely in today's air traffic control environment.

A brief mission analysis was also performed so that questions could be developed to enable an examination to be made of purposes for which the pilot uses his aircraft during instrument flights. The analysis was performed by means of an intellectual assessment of how and why an instrument rated pilot uses his aircraft.

Questionnaire Design

The task description and mission analysis furnished one source from which questions were deduced. A series of meetings with faculty and staff members of the Department of Aviation, Ohio State University, furnished another source. In most instances, a particular question cannot be classified as purely a "profile" or "mission" question. In terms of the data produced by the survey and subsequent analyses, "profile and mission" will be used in the compound sense, not separately.

Upon completion of an inventory of questions, each question was placed on a file card and a "planning board" approach was used to determine question organization and sequence. Instructions for completing the questionnaire were then determined. A review of the adequacy of the questionnaire construction and mechanical considerations was made. The first draft version of the questionnaire was then prepared. This version of the questionnaire was reviewed by project personnel and a representative of the FAA during the contract review meeting on September 11, 1969.

Further questionnaire revisions were made. The draft version dated September 29, 1969, was selected to be pretested.

Questionnaire Pretest

A questionnaire pretest was conducted to find its weaknesses and provide a basis upon which to estimate an expected response rate. The pretest consisted of three activities: (1) a mail pretest to pilots, (2) a meeting to review the questionnaire with FAA representatives from the Columbus, Ohio, General Aviation District Office, and Port Columbus air traffic control tower on September 26, and (3) a review of the questionnaire by the FAA Aircraft Development Service.

On September 30, 1969, the September 29 draft version of the questionnaire was sent to 61 selected instrument rated pilots in the Columbus metropolitan area. A follow-up post card was mailed on October 7. In a period of one month, 45 questionnaires were returned, a response rate of 74%. In addition to providing valuable information for the modification of the questionnaire, the pretest indicated that the mean time to complete the questionnaire was 33 minutes, the median 30, and the mode 20. These times are within an acceptable range in terms of proper questionnaire length. Inasmuch as the private pilot profile and mission study (Report No. FAA DS-68-15) achieved a response rate of 44%, it was concluded that the instrument pilot survey should achieve a response rate between 44% and 74%.

The final draft version of the questionnaire was determined and Bureau of the Budget approval of the questionnaire was requested by letter on October 16, 1969. Approval was granted on November 24. The questionnaire was then precoded for ease of keypunching the data for computer analysis. A copy of the questionnaire form appears in Appendix B.

Survey Mailing Procedure

There were three different mailings developed for the survey.

The original mailing consisted of (1) a cover letter, (2) the questionnaire, (3) a return envelope for the questionnaire, (4) an IBM card with the respondent's code prepunched to provide incentive (respondent) and follow-up (non-respondent) mailing lists, (5) and a return envelope for the IBM card.

The follow-up mailing consisted of the same materials, except for a different cover letter prepared especially for the follow-up.

A vinyl plastic chart wallet was selected as the incentive. The incentive mailing consisted of the chart wallet and a letter of appreciation.

A magnetic tape control listing was prepared containing the sample of instrument rated pilots to be surveyed. The magnetic tape also provided a ready source of computer printed mailing labels for each of the three mailings, which were machine applied.

IV. SURVEY ADMINISTRATION

Survey administration includes the following activities:

1. Determine sampling procedure.
2. Perform survey mailing and analyze response.
3. Process responses.
4. Conduct nonresponse analysis.

Sampling Procedure

The Federal Aviation Administration (FAA) defined the airman population to be surveyed as all active instrument rated private and commercial pilots. The FAA, through the Aircraft Development Service, provided a computer magnetic tape of the population obtained from the FAA Airman Directory File dated January 1, 1969, said to be the latest information available. The tape was received on August 21, 1969. The Airman Directory contains records for each certificated airman who has been issued a valid airman medical certificate within the 30 months preceding the date of the Directory.

The tape contained 102,532 instrument rated private and commercial pilots. Airmen with addresses not in the 50 states and the District of Columbia were deleted because of the possibility that their IFR flight operations would not be typical. The final sample population contained 100,498 airmen, 91,819 commercial pilots and 8,679 private pilots.

During the contract review meeting with the FAA on September 11, 1969, the levels of statistical uncertainty which could be expected at various survey response levels was discussed. The budgetary constraint on sample size and estimated response rates were also considered. It was determined that a sample size of approximately 300 would be reasonable.

The Airman Directory is arranged in alphabetical sequence by state, city within state, and airman within city. This form of a sample population file allows a convenient application of systematic sampling, which yields a proportional representation by

geographic location in the sample drawn. A systematic sampling procedure was applied to commercial pilots in the file by selecting the first record at random and then each 33rd record thereafter. The same sampling procedure was applied to the private pilots. The private and commercial pilots were sampled separately in order to produce a ratio of private to commercial pilots in the sample equal to that of the sample population. A total sample size of 3,046 was thus produced, consisting of 263 private pilots and 2,783 commercial pilots.

Survey Mailing and Response Analysis

Because approval of the questionnaire form had not been given until November 24, it was decided to delay the initial mailing until after January 1, to avoid the Christmas mail rush. The original mailing to 3,046 airmen was sent on Monday, January 5, 1970. Preparations were then made to conduct a follow-up mailing four weeks later. On February 2, a follow-up mailing was sent to the 1,576 airmen from whom no return had been received. The response is indicated in Tables 2 and 3.

TABLE 2

BASIS FOR RESPONSE RATE DETERMINATION

Item (1)	Survey Returns	
	Through February 2 (2)	Through Survey Cutoff March 7 (3)
Original mailing	3,046	3,046
Less: Post office returns	<u>159</u>	<u>191</u>
Basis for response rate	2,887	2,855

TABLE 3
SURVEY RESPONSE RATE

Questionnaires Returned	Questionnaire Returns			
	Through Feb. 2		Through Survey Cutoff Mar. 7	
	Number	Rate	Number	Rate
(1)	(2)	(3)	(4)	(5)
Usable	1351	46.8%	1767	61.9%
Unusable	<u>31</u>	<u>1.1</u>	<u>83</u>	<u>2.9</u>
Total	1382	47.9%	1850	64.8%

The effect of the follow-up mailing was to increase the total response rate by as much as 30%, further insuring a reliable and valid survey. The overall total response rate of 65% is considered exceptionally high for a survey of this nature.

Response Processing

As the questionnaires were received they were coded and date stamped. A daily log was kept to enable a response analysis to be made.

All but the last four questions on the questionnaire (Appendix B) were precoded for ease in keypunching the data. As the questionnaires were returned codes were developed for responses to the open-end questions 40, 41, 42. Question 43 did not produce responses which could be coded. A coding manual was developed which served as a guide in keypunching the data.

Each questionnaire required four data cards. The data was keypunched twice, and the cards compared to resolve keypunch errors.

Nonresponse Analysis

The important point about nonresponse is not the reduced size of the sample, but the possibility of a bias in the data in favor of the respondents. A nonresponse analysis permits the determination of the probable existence of a bias in the data.

Survey research has shown that respondents who return their questionnaire very late are roughly similar to nonrespondents. Since the questionnaires were date stamped as they were received, it was possible to carry out a nonresponse analysis by comparing late respondents to early respondents. The questionnaires were batched chronologically by receipt date for keypunching. Each batch, except the last one, contained 100 questionnaires. Batches 4 and 5 were compared to batch 18 to test the difference in response patterns for selected questions, as shown in Table 4.

The nonresponse analysis indicates that there is little or no statistical difference between the respondents and the nonrespondents in the sample. The higher than expected number of military pilots in the later batches can be explained by the time lag in receiving their reply from overseas.

TABLE 4

NONRESPONSE ANALYSIS

<u>Questionnaire</u>			<u>Test of Significance</u>		<u>Finding</u>
<u>Ques- tion</u> (1)	<u>Data Card</u> (2)	<u>Card Cols.</u> (3)	(4)		(5)
1	1	6	Chi-squared using a contingency table.		No significant difference at 5% level.
3	1	43	Chi-squared using a contingency table.		No significant difference at 5% level.
5	1	49,50	"t" test on difference of means.		No significant difference.
8	1	75-78	"t" test on difference of means.		No significant difference.
9	1	79	Chi-squared using a contingency table.		No significant difference at 5% level.
9	1	80	Chi-squared using a contingency table.		Significant at the 5% level. Refer to finding for Question 18.
10	2	10-13	"t" test on difference of means.		No significant difference.
18	2	69&70	Chi-squared using a contingency table.		Significant at the 5% level. Inspection of responses indicated fewer military and more personal pilots than expected in early responses and conversely for late responses.

V. OPERATIONAL FLIGHT PROFILE DEVELOPMENT

From the information gained in the survey, two operational flight profiles were developed depicting:

1. the most difficult and complex operation.
2. the medium operation.

The steps involved in developing the operational profiles included a determination of the data subsets to be obtained and the profiles.

Determination of Data Subsets

The survey produced a total set of data represented by a deck of 7,068 IBM cards, four for each respondent. The following data subsets were determined to be appropriate for this study:

Total Set of Data (Appendix C)	
General Aviation IFR Data	(Appendix C)
Medium Profile Data	(Appendix D)
Complex Profile Data	(Appendix D)
Other Data	

As a first step in the analysis process, frequency counts were obtained for the total set of data using the IBM 360 computer at The Ohio State University Computer Center. For discrete type data, the BMD04D alphanumeric frequency count program was used. For continuous type data, the BMD08D cross-tabulation program was used.

The frequency counts for Question 18, shown in Table 5, indicate that 41% of the FAA certificated instrument rated private and commercial pilots most often engage in airline or military flying. The analysis presented in Table 6 shows that the type of IFR flying that a pilot engages in does not differ from his "all flying" activities.

"General Aviation IFR" is the descriptive term used in this report to define the 739 airmen who reported that general aviation was the type of IFR flying in which they most often engaged during the last twelve months. The "Total" data in Appendix C includes all IFR flying reported, general aviation, airline, and military. Appendix D is limited to "General Aviation IFR" data.

TABLE 5

TYPE OF FLYING ENGAGED IN BY THE
INSTRUMENT RATED PRIVATE AND COMMERCIAL PILOT
(Question 18)

<u>Type of Flying</u> (1)	<u>Type of Flying Most Often Engaged in During Last 12 Months</u>	
	<u>All Flying</u> (2)	<u>IFR Flying</u> (3)
General Aviation	846	739
Airline	258	260
Military	461	465
Ambiguous	83	47
No response	<u>119</u>	<u>256</u>
Total	1767	1767

TABLE 6

ALL FLYING vs. IFR FLYING DOES NOT DIFFER
(Question 18, Col. 69 vs. Question 18, Col 70)

<u>IFR Flying</u> (1)	<u>Type of All Flying Most Often Engaged in During Last 12 Months</u>					<u>Total</u> (7)
	<u>General Aviation</u> (2)	<u>Airline</u> (3)	<u>Military</u> (4)	<u>Ambiguous</u> (5)	<u>No Response</u> (6)	
General Avn	<u>703</u>	5	8	10	13	739
Airline	2	<u>231</u>	3	3	21	260
Military	10	5	<u>431</u>	6	13	465
Ambiguous	3	2	0	39	3	47
No response	<u>128</u>	<u>15</u>	<u>19</u>	<u>25</u>	<u>69</u>	<u>256</u>
Total	846	258	461	83	119	1767

A determination then had to be made about what data should be analyzed to generate the two operational profiles. This determination was made by reexamining the ultimate objective of the study. As indicated in the FAA RFP, the objective of this and similar studies is to determine the feasibility of training pilots to a standard of operational competence as a criterion for certification. An analysis of the type of instrument pilot which the FAA certificates provided an answer to the question of what data should be analyzed to obtain the two operational profiles.

Tables 7 and 8 demonstrate quite clearly that three-quarters of the instrument rated private and commercial pilots which FAA certificates are general aviation pilots, and the other one-quarter are issued the instrument rating on the basis of military competence. As shown in Table 8, 62% of the instrument rated private and commercial pilots certificated by the FAA as general aviation pilots are presently operating as general aviation pilots. 11% certificated as general aviation pilots became airline pilots, and 3% became military pilots.

TABLE 7

TYPE OF IFR FLYING vs. HOW INSTRUMENT RATING OBTAINED
(Question 18 vs. Question 6)

How Instrument Rating Obtained (1)	Type of IFR Flying Most Often Engaged in During Last 12 Months					Total (7)
	General Aviation (2)	Airline (3)	Military (4)	Ambiguous (5)	No Response (6)	
Completion of tests and ex- perience	451	62	17	18	98	646
Graduate of approved school	170	51	10	7	40	278
Military competence	103	134	418	13	106	774
Ambiguous	13	12	20	9	10	64
No response	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>5</u>
Total	739	260	465	47	256	1767

TABLE 8

THE FAA's ROLE IN INSTRUMENT RATING CERTIFICATION

(Developed from Table 7)

<u>How Instrument Rating Obtained</u> (1)	<u>Type of IFR Flying Most Often Engaged in During Last 12 Months</u>		
	<u>General Aviation</u> (2)	<u>Airline</u> (3)	<u>Military</u> (4)
Completion of required FAA tests and experience	45%	6%	2%
Graduate of approved flying school	17%	5%	1%
Military Competence	10%	13%	not applicable

In view of the fact that the FAA, for all practical purposes, flight tests only general aviation pilots for the instrument rating, it was decided that only general aviation IFR data would be analyzed to obtain the medium and complex operational profiles. Question 18, Column 70, enables a distinction to be made between the pilot who has most often engaged in general aviation IFR flying (codes 1 through 7) and those pilots who have engaged in all other types of flying. It was on this basis that the first separation of data was performed. Appendix B presents the general aviation IFR data subset and the total survey data. The "other" data subset, which is the difference between the total and general aviation IFR data, is not presented because it is less meaningful than the total data representing the total population.

Questions are often raised concerning the statistical level of confidence of a survey. However, the level of confidence can be determined only for the individual questions in a questionnaire. In a questionnaire of any length, the calculation of statistical confidence for each item is of doubtful value. The purpose of a survey is to estimate the characteristics of a population. For any one characteristic, the discrepancy between the actual and estimated value of a characteristic is called the sampling error. Statistical confidence is expressed as an assurance that in x out of 100 samples the true value of the population characteristic

is within the estimated range of the error. For example, in this survey a calculation of the statistical confidence was made for illustrative purposes on the total time of the general aviation IFR subset (Question 8). The analysis indicated that the mean total time of the general aviation IFR pilot is 3,447 hours, and the median is 2,000 hours. It also indicated an 8% error at the 95% confidence level. This means that one is sure that 95 samples out of 100 would contain the population mean in an interval within plus or minus 8% of 3,447 hours.

Determination of Profiles

A set of decision rules was developed and applied to the data to generate the medium and complex operational flight profiles. An a priori process was used to develop the profile decision rules, which proceeded through several iterations. The reasonableness of the final set of rules was tested as follows: (1) by examining the type of pilots characteristic of each profile, (2) inspecting the distribution of the general aviation IFR data by profile (Appendix D), and (3) by comparing selected data between profiles at the 5% level of statistical significance.

The philosophy in selecting the decision rules required that they (1) be operationally oriented, and (2) that they be factual in nature rather than based upon opinion.

The decision rules were developed to separate the complex profile from the general aviation IFR data. By definition, what remained would be the medium profile data. The final set of decision rules is listed in Table 9. To qualify for the complex profile, a pilot must meet all of the selection criteria required by the complex decision rules.

Table 10 presents the type of IFR flying most often engaged in by the complex profile instrument pilot.

TABLE 9

COMPLEX PROFILE DECISION RULES

1. Starting with a sample size of 739 in the general aviation IFR subset, a pilot qualified for the complex profile if he flies on an IFR flight plan on the average of at least about every other week (Question 9, Column 80). 364 qualified for the complex profile as a result of applying this first criterion for selection.
2. Of the 364 remaining, each must have made an actual instrument approach during the last 12 months (Question 28, Column 54).
3. Of the 351 remaining, each must have had to hold at least once during the last 12 months (Question 31, Columns 69, 70).
4. Of the 291 remaining, each must have two 360 channel transceivers or one 360 and one 90 channel transceiver (Question 2, Columns 17, 18). 262 pilots remained qualified for the complex profile.
5. An inspection of the coding manual for Question 31, the number of holds during the last 12 months, indicated that ambiguous answers were keypunched when the response was not a specific number of times, but a range. Ambiguous answers to Question 31 were kept in the complex profile. All other ambiguous answers and all nonresponse answers to the questions which comprise the set of complex profile decision rules caused the pilot to be classified in the medium profile.

TABLE 10

TYPE OF IFR FLYING MOST OFTEN ENGAGED IN
BY COMPLEX INSTRUMENT PILOTS

Type of IFR General Aviation Flying (1)	Complex Profile		General Aviation IFR (4)	Complex % of General Aviation IFR (5)
	Number (2)	% of Total (3)		
Business				
not for hire	72	27%	207	35%
corporate pilot	76	29	120	63
Air taxi or charter	64	24	108	59
Aerial application	0	0	0	0
Industrial/special	1	0	9	11
Giving instruction	29	11	84	35
Personal	<u>20</u>	8	<u>211</u>	9
Total	262		739	

Col. (3) - number in Col. (2) divided by 262.

Col. (5) - number in Col. (2) divided by number in Col. (4).

As shown in Table 10, the complex profile instrument pilot is most often engaged in business (not for hire or as a corporate pilot) flying and air taxi or charter flying activities. This finding is not surprising, and in fact supports the set of decision rules applied to select the complex profile. By the very nature of their purpose for flying, business and air taxi or charter pilots must fly in more adverse operational environments, especially weather, in which the personal or instructional pilot can and does choose not to operate. A comparison made between the medium and complex profile data (Appendix D) in a manner similar to the way in which the typical general aviation IFR operation was developed in Chapter II also indicated the overall reasonableness of the profiles. Finally, tests of the differences in the data between profiles revealed that statistical differences do indeed exist.

Table 11 presents selected comparisons of the operational profiles of the complex and medium pilots.

TABLE 11

THE COMPLEX INSTRUMENT PILOT PROFILE
AS COMPARED TO THAT OF
THE MEDIUM INSTRUMENT PILOT

1. The complex pilot flies a more sophisticated aircraft. It has a higher cruise and instrument approach speed, communications and navigation equipment with greater capability, and more special equipment. (Q. 1 and 2)
2. The complex pilot operates at busier airports. (Q. 17)
3. He is more likely to make approaches to minimums than the medium pilot. (Q. 21)
4. The complex pilot will make a "go" decision more often than the medium pilot in more adverse weather situations. (Q. 22)
5. In good VFR conditions, the complex pilot will more frequently file an IFR flight plan. (Q. 23 and 25)
6. He more often finds it necessary to file an IFR flight plan in flight. (Q. 26)
7. He is more likely to have made an actual instrument approach to lower minimums than the medium pilot. (Q. 28)
8. The complex pilot is more likely to have had to execute a missed approach or had to divert to an alternate. (Q. 31)
9. He has less difficulty in making instrument approaches. (Q. 32)

VI. DETERMINATION OF AERONAUTICAL SKILL AND KNOWLEDGE REQUIREMENTS

Objective

In determining aeronautical skill and knowledge requirements based upon the information developed in the operational profiles, the objective was not to overhaul and rewrite the requirements of the present instrument rating certification system. Such an approach would have been presumptuous indeed using information produced from a questionnaire. Further, the approach would have required an effort many times larger than the present study. The fact that more than 100,000 instrument ratings have been issued over the last decade is strong evidence that the present instrument rating certification system works.

Instead, the intent of this determination of skill and knowledge requirements is to indicate generalized modifications to the present process of certificating the instrument rated pilot in a manner which will make it more consistent with how he actually operates in today's air traffic control system. This approach emphasizes operational skill and knowledge and deemphasizes required hours of experience for certification. The details of how such a certification program is to be administered is not within the scope of this study.

Review of Present Instrument Rating Certification Process

An airman certification program consists of all those activities required in establishing the requirements for a certificate, administering the tests which determine an applicant's qualifications for a certificate, and issuing the certificate.

Under the present certification process, an applicant receives a certificate if he meets certain eligibility requirements, such as age, and demonstrates that he possesses a minimum required level of aeronautical knowledge, skill, and experience:

1. Knowledge - is the act, fact, or state of knowing. An applicant's level of aeronautical knowledge is determined by means of a written examination for the instrument rating. The knowledge requirements are provided by FAR 61.35, and are elaborated

on in the Instrument Rating (Airplane) Written Test Guide (AC 61-8B), and the Instrument Pilot (Airplane) Written Examination Subject Matter Outline (AC Form 8060-37-6).

2. Skill - is great ability or proficiency. An applicant's level of aeronautical skill is determined by means of a flight test administered by an FAA inspector, designated examiner, or pilot school with examining authority. The skill requirements for the instrument rating are provided by FAR 61.37 (Appendix E), and are elaborated on in the Flight Test Guide - Instrument Rating Airplane (AC 61-17A).
3. Experience - is that which has been observed or lived through. An applicant's level of aeronautical experience is evidenced by appropriate logbook entries. The experience requirements for the instrument rating are provided by FAR 61.35 (Appendix E).

The complicated nature of the present instrument rating certification process is illustrated above. It should be noted that basically all airman certification is accomplished within this conceptual framework and that the instrument rating is one of many airman certificates issued by the FAA.

The purpose of the skill and knowledge requirements presented later in this chapter are designed not to disturb the basic certification process, which has proven to be fundamentally sound, but to orient it more toward the operational competence of the applicant, based upon the results of the instrument pilot survey.

Conceptual Approach

With respect to the instrument pilot, a task is a specific function to be performed by him in the IFR environment, such as to fly an instrument approach. Task activities are those specific actions which are required to successfully accomplish the task.

There are four key task activities which occur during an IFR flight operation:

1. Control of the aircraft.
2. Communication with air traffic control.
3. Use of printed information.
4. Decision making, which includes judgement and planning (inflight and preflight).

All tasks occur within the dynamic IFR system of which the pilot and the aircraft are a part. Such tasks are subject to time constraints which are much more critical in the IFR than the VFR situation. The tasks are also performed with contingency factors present which can greatly exaggerate the man-machine-environment relationships within given task activities. Contingencies include adverse weather, inflight emergencies, crowded airspace, pilot fatigue, etc.

Routine tasks can often be anticipated with each step being performed in some specified order, such as a standard instrument approach. A non-routine task is unanticipated and may require additional decision making and control actions within set time constraints.

The tasks in an instrument flight require a pilot to divide his attention between control, communication, use of printed information, and decision making activities. The actual division of attention is dependent upon the degree to which contingency factors are present and the particular task to be performed.

Figure 1 is the model based upon this conceptual approach. It was used in designing the questionnaire and developing skill and knowledge requirements by inferential analyses of the survey results. It is a non-quantitative approach which yields requirements of a general, rather than specific nature.

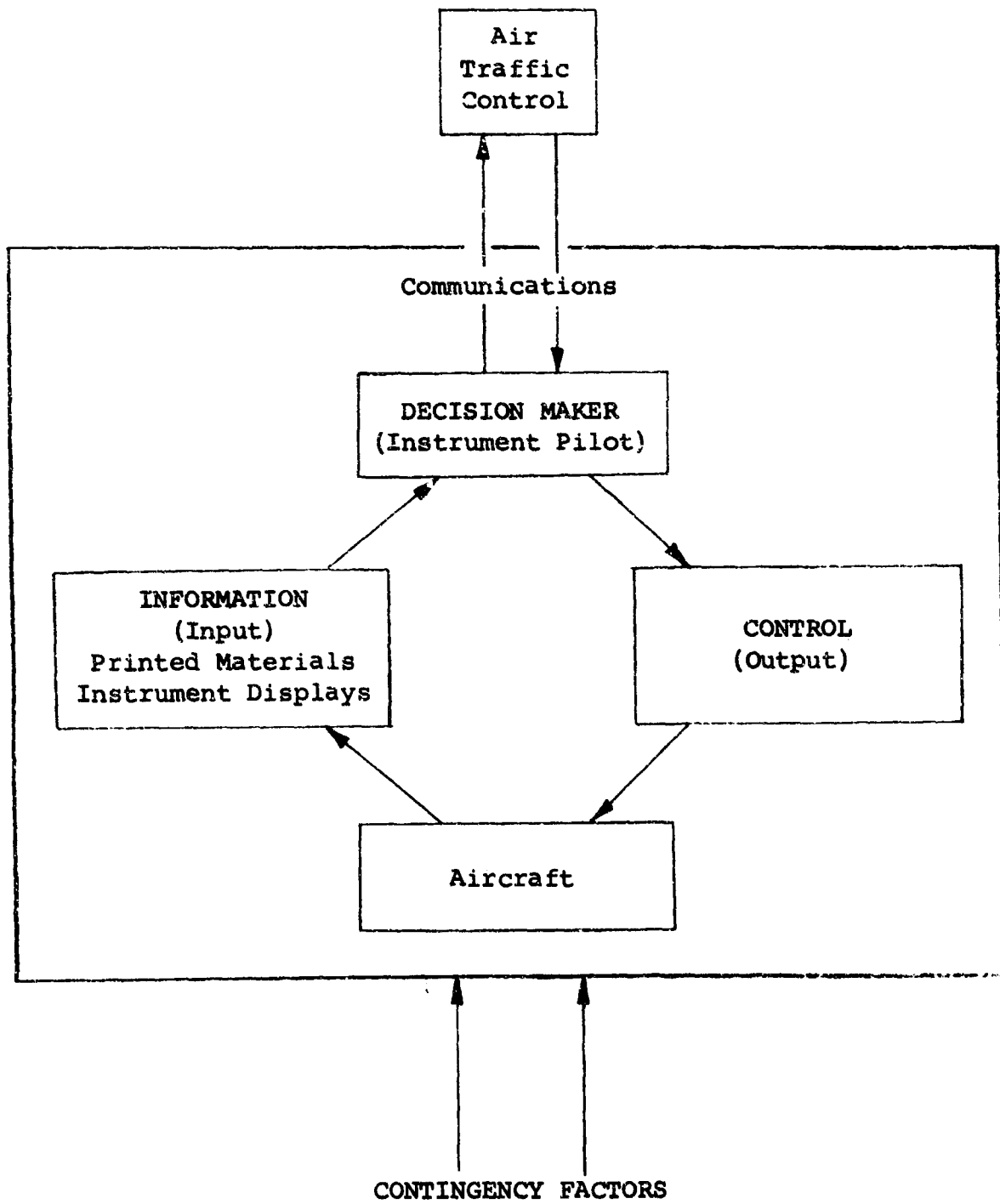
Rationale for Skill and Knowledge Requirements

The following discussion provides an indication of the rationale used in developing the requirements.

Control of Aircraft

Questions 16, 17, and 28 indicate that ILS and VOR approaches

FIGURE 1
CONCEPTUAL MODEL



are made most frequently by both the medium and complex pilot, indicating a need for them to demonstrate a skill in flying both types of approaches.

Questions 14 and 41 clearly indicate that the instrument rated pilot, regardless of his level of complexity, believes that actual instrument experience is worthwhile during training for the instrument rating.

Questions 21 and 28 indicate that the medium pilot is not making approaches to minimums as low as the complex pilot. In order to give the medium pilot a wide safety margin for error correction and additional time to make critical decisions, higher ceiling and visibility minimums are necessary.

The responses to Question 37 indicate that the medium pilot has more difficulty with nearly all IFR conditions except during the normal departure and transition phases. Question 38 responses indicate that heading and altitude control seemed to deteriorate first. Question 37 also indicated that the approach phase is particularly critical in all IFR conditions, with strong winds apparently causing the most difficulty.

Communication With ATC

As indicated in Question 13, about two-thirds of the pilots visited an approach/departure control facility during their training. During a review of a draft version of the questionnaire, controllers indicated a belief that some instrument rated pilots do not appreciate how their individual flight operation relates to the overall ATC system.

The conceptual model implies that a pilot's "limited channel capacity" to perform tasks probably occurs in the decision making phases of the tasks. The pilot is also primarily a sequential processor of information. Giving undivided attention to communications, for example, results in other task activities queueing up for later attention. The highly skilled pilot achieves optimum overall performance by correctly dividing his attention among the task activities. A difference in pilot skill level will be indicated by symptoms of sub-optimum performance. These symptoms include deterioration in communications and accurately remembering ATC instructions, as illustrated by Question 38.

Use of Printed Information

The necessity of referring to printed material while performing critical tasks adds to the overall difficulty of an IFR operation. In Question 38, the medium pilot, more so than the complex pilot, indicates that accurate use of printed materials is a task activity which deteriorates as the IFR flight becomes more difficult.

Decision Making

The responses to Question 40 clearly indicate a need for the pilot to make sound judgements regarding his personal limitations. Good decision making in a given situation depends upon adequate knowledge of the factors involved and skill in assessing their relationship to any contemplated action. Questions 37 and 41 indicate that hazardous weather situations, in particular, structural icing and thunderstorms, are the most frequent cause for concern and the most difficult to handle. A pilot's decision making ability might be gauged through written and oral examinations which require him to role play specific situations, such as what operational decisions are required for in-flight hazardous weather avoidance, or what to do in the event of a given emergency. For the complex pilot, emphasis should be placed on how to handle adverse in-flight situations. For the medium pilot, emphasis should be placed upon avoidance of potential adverse situations.

Questions 39 and 40 reveal that the ability to plan ahead is an important consideration. Having sufficient time to plan ahead contributes to good decision making. The complex pilot, because of his added skill and knowledge in accomplishing the other task activities (communicating, controlling the aircraft, and using printed materials), should have more time available to anticipate and prepare for future tasks. The medium pilot will not have as much time available to plan ahead, and may not be prepared to execute the proper action at the right time. Therefore, in terms of planning ahead, the medium pilot should be required to demonstrate only a minimum acceptable level of sound decision making ability. The complex pilot, on the other hand, should demonstrate a higher order decision making ability, making decisions which are both sound and timely.

Table 12 presents the general aeronautical skills and knowledge, by task activity, required of the medium and complex instrument rated private and commercial pilot to operate safely in today's air traffic control environment.

TABLE 12

SKILL AND KNOWLEDGE REQUIREMENTS

Task Activity: CONTROL OF AIRCRAFT

1. Both the complex and the medium pilot must have demonstrated their ability to make an ILS and a VOR approach to the published minimums.
2. Both pilots must have logged some actual instrument time during their training for an instrument rating.
3. The medium pilot shall not be permitted to make approaches as low as the complex pilot.
4. The complex pilot shall be required to demonstrate more precise aircraft control, especially heading and altitude, and particularly in the approach phase. Determination shall be made objectively by reference to quantitative standards of performance.

Task Activity: COMMUNICATION WITH ATC

1. Both pilots must have visited an approach/departure control facility during their training for an instrument rating.
2. The medium pilot must make communications which are correct in content, with acknowledgement and proper control response accomplished within a reasonable amount of time. Execution of ATC instructions must be accomplished in a manner which will not endanger himself or adversely interfere with the functions of the air traffic control system.
3. The complex pilot must communicate concisely, accurately, and promptly. Required control responses should be immediate. Forgetting air traffic control instructions or incorrect control responses shall be disqualifying.

TABLE 12

SKILL AND KNOWLEDGE REQUIREMENTS

Task Activity: USE OF PRINTED INFORMATION

1. The medium pilot must be sufficiently familiar with flight information publications to find needed information in a reasonable amount of time and without excessive performance deterioration under normal IFR conditions.
2. The complex pilot must be able to refer to flight information publications and promptly ascertain information required without a deterioration in performance under non-normal IFR conditions.

Task Activity: DECISION MAKING

1. Both the medium and complex pilot shall demonstrate his understanding of hazardous weather and emergency situations by means of an oral and/or written analysis of a typical hazardous weather situation
2. The medium pilot must demonstrate his knowledge of the characteristics and hazards associated with icing and thunderstorm conditions. He must know how to avoid such contingencies.
3. The medium pilot must demonstrate an ability to anticipate future tasks to the extent that essential preparations are performed prior to the time it causes his proper relationship to the system to be lost.
4. The complex pilot, in addition to demonstrating his knowledge of the characteristics and hazards associated with icing and thunderstorm conditions, must demonstrate his ability in operating aircraft anti and de-icing equipment, and knowledge of the flying techniques associated with icing and thunderstorms.
5. The complex pilot must demonstrate a higher order ability to anticipate future tasks and manage his flight.
6. The complex pilot shall demonstrate his ability to make a missed approach to a holding pattern.

SELECTED REFERENCES

1. Backstrom, Charles H. and Hursh, Gerald D. Survey Research. Northwestern University Press. Evanston, 1963.
2. Bilodeau, Edward A., ed. Acquisition of Skill. Academic Press. New York, 1966.
3. Chapanis, Alphonse. Research Techniques in Human Engineering. Johns Hopkins. Baltimore, 1959.
4. Federal Aviation Administration. Statistical Handbook of Aviation, 1968. Superintendent of Documents.
5. Federal Aviation Administration. U.S. Civil Airmen Statistics, 1969. Office of Management Systems, Washington, D.C.
6. Gagne, R. M., ed. Psychological Principles in System Development. Holt, Rinehart and Winston. New York, 1962.
7. Hogg, Robert V. and Craig, Allen T. Introduction to Mathematical Statistics, 2nd ed. Macmillan. New York, 1965.
8. Jastram, Roy W. Elements of Statistical Inference. California Book Co. Berkeley, 1955.
9. McCormick, Ernest J. Human Factors Engineering, 2nd ed. McGraw Hill. New York, 1964.
10. Mouly, George J. The Science of Educational Research. American Book Company. New York, 1963.
11. Oppenheim, A. N. Questionnaire Design and Attitude Measurement. Basic Books, Inc. New York, 1966.
12. Sanders, A. F., ed. Attention and Performance. North Holland. Amsterdam, 1967.
13. Sinaiko, H. Wallace, ed. Selected Papers on Human Factors in the Design and Use of Control Systems. Dover. New York, 1961.

APPENDIX B

INSTRUMENT PILOT SURVEY

QUESTIONNAIRE

THE OHIO STATE UNIVERSITY

DEPARTMENT OF AVIATION
OHIO STATE UNIVERSITY AIRPORT
BOX 1022
COLUMBUS, OHIO 43210

290116

January 5, 1970

Dear Fellow Airman:

Your experiences as an instrument rated pilot will be an important contribution to a research program being conducted for the Department of Transportation. The ultimate purpose of the research is to develop a more objective instrument pilot flight test. Pilots selected at random from throughout the nation are being asked to spend about thirty minutes in filling out the enclosed questionnaire.

Respondents will be sent a vinyl plastic chart wallet in appreciation for taking time to fill out the questionnaire. It has ten transparent pockets, each of which will hold a C&GS chart.

Survey responses will be consolidated for statistical purposes only. We assure you that your response will be held in the strictest of confidence.

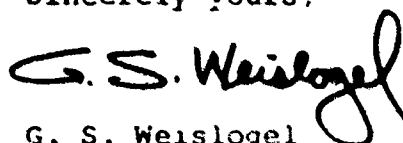
Your cooperation will render a valuable service to the Government, the aviation industry, and to prospective instrument pilots who may benefit from improved flight training. We hope that you will find the questionnaire interesting to answer, and that you will complete and return it to us while you have it close at hand.

To return the completed questionnaire, please:

- (1) Place the questionnaire in the large stamped return envelope enclosed.
- (2) Place the IBM card in the smaller return envelope. This card notifies us that your questionnaire has been returned so that we can send you a chart wallet.

Thank you in advance for your cooperation.

Sincerely yours,



G. S. Weislogel
Assistant Professor and
Principal Research Investigator

GSW:po
Enclosures

INSTRUMENT PILOT SURVEY Questionnaire

INSTRUCTIONS FOR FILLING OUT THE QUESTIONNAIRE

A. Unless otherwise indicated, answer the questions in terms of how you use your instrument rating in the type of airplane you most often fly as pilot in command on an IFR flight plan.

B. Use a pencil. Your logbook will also be helpful in answering certain questions.

C. In all cases, when you do not have an exact answer, your best estimate is acceptable.

D. Check ☒ to indicate your response or fill in as indicated.

AIRPLANE AND EQUIPMENT CHARACTERISTICS

CARD 1

1. What type of airplane do you pilot IFR most often? (check one)

- 6 ☐ single-engine, 1-3 places ☐ turboprop
☐ single-engine, 4 places and over ☐ turbojet
☐ multiengine piston
7 retractable gear ☐ yes ☐ no
8 controllable propeller ☐ yes ☐ no
9 10 year of manufacture: 19____
11-13 average cruise speed: _____ knots
14-16 average instrument approach speed: _____ knots

2. What kind of equipment does the airplane have? (check as applicable)

communication

- 17 360 channel transceiver ☐ one ☐ two
18 90 channel transceiver ☐ one ☐ two
19 other VHF transceiver ☐ yes ☐ no
20 other VHF transmitter ☐ yes ☐ no

navigation

- 21 VOR/LOC receiver ☐ one ☐ two
22 VOR only receiver ☐ one ☐ two
23 glide slope receiver ☐ one ☐ two
24 ☐ ADF
25 ☐ RMI
26 ☐ marker beacon
27 ☐ transponder
28 ☐ DME
29 ☐ course line computer

special

- 30 ☐ pitot heat
31 ☐ control surface anti-icing or de-icing
32 ☐ propeller anti-icing
33 ☐ windshield anti-icing
34 ☐ weather radar
autopilot capability
☐ roll ☐ pitch ☐ altitude
35 36 37
38 ☐ approach coupler
39 ☐ headset mounted microphone
40 ☐ oxygen
41 ☐ cabin pressurization
42 ☐ other (please specify)

3. How do you obtain an instrument airplane most often? (check one)

- 43 ☐ sole owner ☐ company owned
☐ part owner (not club) ☐ rent
☐ club member ☐ military
☐ borrowed

4. How much did you have to say about the selection of the aircraft? (check one)

- 44 ☐ none ☐ some
☐ little ☐ much

FLYING EXPERIENCE

5. In what year did you receive your original airman certificates?

private: 19____ commercial: 19____
45, 46 47, 48
instrument rating: 19____
49, 50

6. On what basis did you receive your instrument rating? (check one)

- 51 ☐ completion of required FAA tests and experience
☐ graduate of approved flying school
☐ military competence

7. What other airman certificates and ratings do you have? (check as applicable)

- 52 ☐ single engine 56 ☐ flight instructor/airplane
53 ☐ multi-engine 57 ☐ flight instructor/instrument
54 ☐ ATR 58 ☐ ground instructor/advanced
55 ☐ helicopter 59 ☐ ground instructor/instrument

8. What is your?:

total time _____ hours 60-64
total pilot in command time _____ hours 65-69
total co-pilot time _____ hours 70-74
total time in last 12 months _____ hours 75-78

9. How often, on the average, do you fly?

	VFR (check one)	on an IFR flight plan (check one)
less than once per month	<input type="checkbox"/> 79	<input type="checkbox"/> 80
about monthly	<input type="checkbox"/> 81	<input type="checkbox"/> 82
about every other week	<input type="checkbox"/> 83	<input type="checkbox"/> 84
about once per week	<input type="checkbox"/> 85	<input type="checkbox"/> 86
more than once per week	<input type="checkbox"/> 87	<input type="checkbox"/> 88

CARD 2

10. What is your instrument time? (If none, enter 0)

	in last 6 mos.	in last 12 mos.	total
total:	6-9	10-13	14-17
actual instrument			
in an airplane:	18-21	22-25	26-29
simulated instrument			
(hood time)			
in an airplane:	30-33	34-37	38-41
ground trainer			
(e.g. Link):	42-45	46-49	50-53

11. If you haven't been a pilot in command in actual instrument weather conditions in the last 6 months, why not? (check one)

- ☐ not applicable, I have been
☐ I needed to go IFR but wasn't proficient enough
☐ I wasn't proficient and didn't need to go IFR
☐ I was proficient, but didn't need to go IFR
☐ an equipment malfunction prevented me from going IFR
☐ other (please specify) _____

12. When was your last instrument dual instruction or instrument flying evaluation ride? 19____
55, 56

13. What ATC facilities did you visit during your instrument training? (check as applicable)

- 57 ☐ air route traffic control center 59 ☐ tower
 58 ☐ approach/departure control facility 60 ☐ none

14. How much actual instrument time during training for the instrument rating do you consider worthwhile? _____ hours
61, 62

TYPICAL FLIGHT CHARACTERISTICS

15. Where do you originate most of your IFR flights? 63-66

airport _____
 city _____ state _____

16. What instrument approach do you most often make at the airport from which you originate most of your IFR flights? (check one)

- 67 ☐ ILS ☐ VOR ☐ radar vectors
 ☐ LOC ☐ ADF ☐ none

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17. What type of instrument approach have you most often made during the last 12 months? (check one)

- 68 ☐ ILS ☐ VOR ☐ radar vectors
 ☐ LOC ☐ ADF ☐ none

18. In what type of flying were you most often engaged during the last 12 months?

	all flying (check one) 69	IFR flying (check one) 70
general aviation		
business (not for hire)	<input type="checkbox"/>	<input type="checkbox"/>
business (corporate pilot)	<input type="checkbox"/>	<input type="checkbox"/>
air taxi or charter	<input type="checkbox"/>	<input type="checkbox"/>
aerial application	<input type="checkbox"/>	<input type="checkbox"/>
industrial/special (e.g. photography)	<input type="checkbox"/>	<input type="checkbox"/>
giving instruction	<input type="checkbox"/>	<input type="checkbox"/>
personal (pleasure)	<input type="checkbox"/>	<input type="checkbox"/>
airline	<input type="checkbox"/>	<input type="checkbox"/>
military	<input type="checkbox"/>	<input type="checkbox"/>

CARD 3

19. What flight information publications do you usually take with you on an IFR flight? (check as applicable)

- 6 ☐ AIM — Part I
 7 ☐ AIM — Part II
 8 ☐ AIM — Part III
 9 ☐ USGS Enroute Low Altitude Charts
 10 ☐ USGS Enroute High Altitude Charts
 11 ☐ USGS Instrument Approach Procedure Charts
 12 ☐ USGS Standard Instrument Departure Charts
 13 ☐ Jeppesen Complete Airway Manual Service
 14 ☐ Jeppesen Standard Airway Manual Service
 15 ☐ Military charts
 16 ☐ other (please specify) _____
 17 ☐ the publications are usually current

20. What factor has caused you most often to cancel an intended IFR flight just before planned departure during the last 12 months? (check one)

- 18 ☐ I have not had to cancel a proposed IFR flight
 ☐ weather worse than published minimums
 ☐ weather beyond my personal limitations
 ☐ weather beyond aircraft/equipment capability
 ☐ equipment malfunction
 ☐ lack of adequate flight weather information and/or publications
 ☐ factors unrelated to aircraft, equipment, or weather
 ☐ other (please specify) _____

21. In deciding whether or not to depart for a destination reported to be IFR, what are your personal weather minimums for making each of the following types of approaches during the daytime? (check one box on each line)

	ceiling (in feet)	visibility (in miles)									I always use published minimums		I seldom make this type of approach
		1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2				
ILS 19-22	23 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or	<input type="checkbox"/>	or	<input type="checkbox"/>
LOC 24-27	28 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or	<input type="checkbox"/>	or	<input type="checkbox"/>
VOR 29-32	33 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or	<input type="checkbox"/>	or	<input type="checkbox"/>
ADF 34-37	38 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or	<input type="checkbox"/>	or	<input type="checkbox"/>

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22. If the following weather conditions were reported to exist anywhere enroute, what would you do? (check one box each line)

	not go	Probably not go	Probably go	go
11 light icing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12 moderate icing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 heavy icing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 scattered thunderstorms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 broken thunderstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 lines of thunderstorms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 heavy ground fog	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

23. How frequently do you file an IFR flight plan before departure during the daytime when the weather at your intended destination is forecast to be: (check one box on each line)

	almost never	seldom	often	almost always	never had the experience
18 good VFR (ceiling better than 5000', visibility better than 5 miles)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
19 VFR (ceiling 1,000' to 5,000', visibility 3 to 5 miles)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 IFR (ceiling less than 1,000', visibility less than 3 miles)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

24. When you depart an airport which is in IFR weather, how frequently do you cancel IFR as soon as you reach VFR conditions? (check one)

21 <input checked="" type="checkbox"/> almost never	<input checked="" type="checkbox"/> often	<input checked="" type="checkbox"/> never
<input checked="" type="checkbox"/> seldom	<input checked="" type="checkbox"/> almost always	had the experience

25. How frequently do you file an IFR flight plan before departing on a flight which is conducted entirely during the daytime in good VFR conditions? (check one)

22 <input checked="" type="checkbox"/> almost never	<input checked="" type="checkbox"/> often	<input checked="" type="checkbox"/> never
<input checked="" type="checkbox"/> seldom	<input checked="" type="checkbox"/> almost always	had the experience

26. How frequently do you file an IFR flight plan in flight? (check one)

23 <input checked="" type="checkbox"/> almost never	<input checked="" type="checkbox"/> often	<input checked="" type="checkbox"/> never
<input checked="" type="checkbox"/> seldom	<input checked="" type="checkbox"/> almost always	had the experience

27. On the average what percentage of your time on instrument flight plans is in actual instrument conditions?

%

28. Have you had to make an actual instrument approach during the last 12 months? ☒ yes ☒ no If yes, complete remainder of question for the lowest approach you made

ceiling (in feet)

	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2
visibility (in miles)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
type of approach	<input checked="" type="checkbox"/> ILS	<input checked="" type="checkbox"/> VOR	<input checked="" type="checkbox"/> radar				
	<input checked="" type="checkbox"/> LOC	<input checked="" type="checkbox"/> ADF					

29. Within what radius of your home airport do you most often operate IFR? _____ nm

61-64

30. What was the one way distance of your longest nonstop flight on an IFR flight plan as pilot in command during the last 12 months? _____ nm

65-68

31. During the last 12 months, how many times have you:

had to hold?	_____ 69, 70
had to execute a missed approach?	_____ 71, 72
been rerouted?	_____ 73, 74
had to divert to an alternate?	_____ 75, 76

CARD 4

32. How do you rate the degree of difficulty of each of the following approaches? (check one box on each line)

	little	some	much	extreme	I seldom make this type of approach
6 LOC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	or <input checked="" type="checkbox"/>
7 ADF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or <input type="checkbox"/>
8 VOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	or <input type="checkbox"/>
9 ILS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	or <input checked="" type="checkbox"/>

33. How frequently do you have someone assist you during an IFR flight?

10	<input checked="" type="checkbox"/> almost never	<input checked="" type="checkbox"/> seldom	<input checked="" type="checkbox"/> often	<input checked="" type="checkbox"/> almost always
11	is this person a pilot?			<input checked="" type="checkbox"/> yes <input checked="" type="checkbox"/> no
12	does he have an instrument rating?			<input checked="" type="checkbox"/> yes <input checked="" type="checkbox"/> no
13	is he a required co-pilot?			<input checked="" type="checkbox"/> yes <input checked="" type="checkbox"/> no

34. Have you flown a single engine aircraft:

14 actual IFR?	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no
15 night VFR?	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no
16 night actual IFR?	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no

35. Is 6 hours of instrument experience within the preceding 6 calendar months adequate for you to maintain a safe level of instrument proficiency? (check one)

17 <input checked="" type="checkbox"/> not adequate	<input checked="" type="checkbox"/> adequate	<input checked="" type="checkbox"/> more than adequate
---	--	--

36. If you were to place yourself along a scale of all instrument pilots in terms of aeronautical skill, knowledge, and experience, where would you put yourself? (check one box on each line)

	new instrument pilot	professional pilot
18 skill	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
19 knowledge	<input type="checkbox"/>	<input type="checkbox"/>
20 experience	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

APPENDIX B
Page 5 of 6

DIFFICULTY OF IFR FLIGHT

37. Please read and answer this question carefully.

For each phase of flight under actual instrument conditions, check:

(1) how frequently you have encountered the IFR condition, and (2) how difficult the situation is for you.

For a frequency of never, do not check a difficulty box.

	FREQUENCY OF ENCOUNTER (check one box on each line)				DIFFICULTY (check one box on each line except when frequency is never)			
	never	almost never	seldom	often	little	some	much	extreme
(a) DEPARTURE PHASE — actual IFR								
IFR condition								
normal (does not include any of the conditions which follow)	21 <input type="checkbox"/>	22 <input type="checkbox"/>	23 <input type="checkbox"/>	24 <input type="checkbox"/>	25 <input type="checkbox"/>	26 <input type="checkbox"/>	27 <input type="checkbox"/>	28 <input type="checkbox"/>
minimum ceiling and/or visibility	29 <input type="checkbox"/>	30 <input type="checkbox"/>	31 <input type="checkbox"/>	32 <input type="checkbox"/>	33 <input type="checkbox"/>	34 <input type="checkbox"/>	35 <input type="checkbox"/>	36 <input type="checkbox"/>
light or moderate icing	37 <input type="checkbox"/>	38 <input type="checkbox"/>	39 <input type="checkbox"/>	40 <input type="checkbox"/>	41 <input type="checkbox"/>	42 <input type="checkbox"/>	43 <input type="checkbox"/>	44 <input type="checkbox"/>
light or moderate turbulence	45 <input type="checkbox"/>	46 <input type="checkbox"/>	47 <input type="checkbox"/>	48 <input type="checkbox"/>	49 <input type="checkbox"/>	50 <input type="checkbox"/>	51 <input type="checkbox"/>	52 <input type="checkbox"/>
scattered or broken thunderstorms	53 <input type="checkbox"/>	54 <input type="checkbox"/>	55 <input type="checkbox"/>	56 <input type="checkbox"/>	57 <input type="checkbox"/>	58 <input type="checkbox"/>	59 <input type="checkbox"/>	60 <input type="checkbox"/>
strong winds	61 <input type="checkbox"/>	62 <input type="checkbox"/>	63 <input type="checkbox"/>	64 <input type="checkbox"/>	65 <input type="checkbox"/>	66 <input type="checkbox"/>	67 <input type="checkbox"/>	68 <input type="checkbox"/>
nonroutine ATC instructions	69 <input type="checkbox"/>	70 <input type="checkbox"/>	71 <input type="checkbox"/>	72 <input type="checkbox"/>	73 <input type="checkbox"/>	74 <input type="checkbox"/>	75 <input type="checkbox"/>	76 <input type="checkbox"/>
(b) TRANSITION PHASE (actual IFR between enroute and IFR approach)								
IFR condition								
normal (does not include any of the conditions which follow)	35 <input type="checkbox"/>	36 <input type="checkbox"/>	37 <input type="checkbox"/>	38 <input type="checkbox"/>	39 <input type="checkbox"/>	40 <input type="checkbox"/>	41 <input type="checkbox"/>	42 <input type="checkbox"/>
minimum ceiling and/or visibility	43 <input type="checkbox"/>	44 <input type="checkbox"/>	45 <input type="checkbox"/>	46 <input type="checkbox"/>	47 <input type="checkbox"/>	48 <input type="checkbox"/>	49 <input type="checkbox"/>	50 <input type="checkbox"/>
light or moderate icing	51 <input type="checkbox"/>	52 <input type="checkbox"/>	53 <input type="checkbox"/>	54 <input type="checkbox"/>	55 <input type="checkbox"/>	56 <input type="checkbox"/>	57 <input type="checkbox"/>	58 <input type="checkbox"/>
light or moderate turbulence	59 <input type="checkbox"/>	60 <input type="checkbox"/>	61 <input type="checkbox"/>	62 <input type="checkbox"/>	63 <input type="checkbox"/>	64 <input type="checkbox"/>	65 <input type="checkbox"/>	66 <input type="checkbox"/>
scattered or broken thunderstorms	67 <input type="checkbox"/>	68 <input type="checkbox"/>	69 <input type="checkbox"/>	70 <input type="checkbox"/>	71 <input type="checkbox"/>	72 <input type="checkbox"/>	73 <input type="checkbox"/>	74 <input type="checkbox"/>
strong winds	75 <input type="checkbox"/>	76 <input type="checkbox"/>	77 <input type="checkbox"/>	78 <input type="checkbox"/>	79 <input type="checkbox"/>	80 <input type="checkbox"/>	81 <input type="checkbox"/>	82 <input type="checkbox"/>
nonroutine ATC instructions	83 <input type="checkbox"/>	84 <input type="checkbox"/>	85 <input type="checkbox"/>	86 <input type="checkbox"/>	87 <input type="checkbox"/>	88 <input type="checkbox"/>	89 <input type="checkbox"/>	90 <input type="checkbox"/>
(c) IFR APPROACH PHASE — actual IFR								
IFR condition								
normal (does not include any of the conditions which follow)	49 <input type="checkbox"/>	50 <input type="checkbox"/>	51 <input type="checkbox"/>	52 <input type="checkbox"/>	53 <input type="checkbox"/>	54 <input type="checkbox"/>	55 <input type="checkbox"/>	56 <input type="checkbox"/>
minimum ceiling and/or visibility	57 <input type="checkbox"/>	58 <input type="checkbox"/>	59 <input type="checkbox"/>	60 <input type="checkbox"/>	61 <input type="checkbox"/>	62 <input type="checkbox"/>	63 <input type="checkbox"/>	64 <input type="checkbox"/>
light or moderate icing	65 <input type="checkbox"/>	66 <input type="checkbox"/>	67 <input type="checkbox"/>	68 <input type="checkbox"/>	69 <input type="checkbox"/>	70 <input type="checkbox"/>	71 <input type="checkbox"/>	72 <input type="checkbox"/>
light or moderate turbulence	73 <input type="checkbox"/>	74 <input type="checkbox"/>	75 <input type="checkbox"/>	76 <input type="checkbox"/>	77 <input type="checkbox"/>	78 <input type="checkbox"/>	79 <input type="checkbox"/>	80 <input type="checkbox"/>
scattered or broken thunderstorms	81 <input type="checkbox"/>	82 <input type="checkbox"/>	83 <input type="checkbox"/>	84 <input type="checkbox"/>	85 <input type="checkbox"/>	86 <input type="checkbox"/>	87 <input type="checkbox"/>	88 <input type="checkbox"/>
strong winds	89 <input type="checkbox"/>	90 <input type="checkbox"/>	91 <input type="checkbox"/>	92 <input type="checkbox"/>	93 <input type="checkbox"/>	94 <input type="checkbox"/>	95 <input type="checkbox"/>	96 <input type="checkbox"/>
nonroutine ATC instructions	97 <input type="checkbox"/>	98 <input type="checkbox"/>	99 <input type="checkbox"/>	100 <input type="checkbox"/>	101 <input type="checkbox"/>	102 <input type="checkbox"/>	103 <input type="checkbox"/>	104 <input type="checkbox"/>

38. As a "normal" IFR flight becomes more difficult because of IFR conditions (such as those in the previous question) what one aspect of your flying performance deteriorates first? (check one)

- | | | |
|---|--|---|
| <input type="checkbox"/> altitude control | <input type="checkbox"/> accurate use of enroute and approach charts, etc. | <input type="checkbox"/> accurate interpretation of instrument readings |
| <input type="checkbox"/> heading control | <input type="checkbox"/> accurately remembering ATC instructions | <input type="checkbox"/> other (please specify) _____ |
| <input type="checkbox"/> communications | | |

39. To what do you attribute the flying performance deterioration you indicated in the previous question? (check one)

- | | | |
|--|---|--|
| <input type="checkbox"/> lack of actual instrument flying experience | <input type="checkbox"/> difficulty in staying current on latest procedures and information | <input type="checkbox"/> lack of recent instrument flying practice |
| <input type="checkbox"/> unfamiliarity with ATC instructions | <input type="checkbox"/> not enough time to anticipate future tasks | <input type="checkbox"/> other (please specify) _____ |

PERSONAL OBSERVATIONS

40. In your opinion, what is the most common error made by instrument pilots? 65, 66

41. What changes would you like to see in the training and regulations concerning the certification of new instrument pilots? 67, 68

42. What has been your most uncomfortable or threatening experience during an IFR flight in actual IFR conditions? 69, 70

43. Are there any general comments you wish to make about IFR flying which you think might be useful for us to know? 71, 72

THE OHIO STATE UNIVERSITY

DEPARTMENT OF AVIATION
OHIO STATE UNIVERSITY AIRPORT
BOX 3821
COLUMBUS, OHIO 43210

293-1116

February 2, 1970

Dear Fellow Airman:

A few weeks ago we invited you to take part in a national survey of instrument pilots.

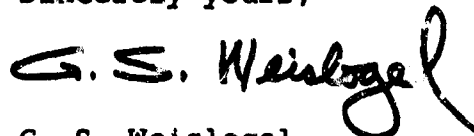
If you have already completed and returned the questionnaire, please accept our thanks for your cooperation. Your chart wallet will be in the mail soon.

If you have not completed and returned the questionnaire, may we urge you to do so now. The value of our study is greatly dependent on the willingness of pilots like yourself to contribute the information we request. Since the sample is large, you may believe that no individual response is important. However, an accurate report depends upon a high rate of return from our sample. Again, let me assure you that your response will be held in the strictest of confidence.

In order for your questionnaire to be included in the statistical analysis, we must receive it no later than Monday, February 16. Your response is essential to the ultimate worth of this survey.

With our thanks for your participation,

Sincerely yours,



G. S. Weislogel
Assistant Professor and
Principal Research Investigator

GSW:po
Enclosures

APPENDIX C
INSTRUMENT PILOT SURVEY
TOTAL DATA

- NOTES:
1. Appendix C is consecutively numbered in the upper right hand corner with Arabic numerals preceded by the capital letter C. The Arabic numerals correspond to the question with the same number in the Instrument Pilot Survey Questionnaire, presented in Appendix B.
 2. Where applicable, percentages will not always add to 100% due to rounding.

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Type of Aircraft</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Single-engine				
1-3 places	57	8%	108	6%
4 places & over	346	47	478	27
Multiengine piston	275	37	522	30
Turboprop	30	4	109	6
Turbojet	21	3	456	26
Ambiguous	9	1	72	4
No response	1	0	22	1
Retractable gear				
yes	491	66%	1351	76%
no	162	22	245	14
ambiguous	2	0	2	0
no response	34	11	169	10
Controllable propeller				
yes	550	74%	970	55%
no	87	12	321	18
ambiguous	1	0	2	0
no response	101	14	474	27

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Year of Manufacture</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Prior to 1950	21	3%	75	4%
1950-1954	16	2	102	6
1955-1959	77	10	248	14
1960	27	4	99	6
1961	17	2	39	2
1962	26	4	75	4
1963	23	3	54	3
1964	41	6	80	5
1965	56	8	131	7
1966	62	8	125	7
1967	72	10	129	7
1968	136	18	197	11
1969	100	14	149	8
1970	6	1	7	0
Ambiguous	17	2	126	7
No response	42	6	131	7

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Average Cruise Speed</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
80-89 knots	5	1%	11	1%
90-99	11	1	20	1
100-109	35	5	73	4
110-119	35	5	52	3
120-129	50	7	74	4
130-139	80	11	108	6
140-149	80	11	111	6
150-159	77	10	141	8
160-169	92	12	155	9
170-179	55	7	91	5
180-189	80	11	137	8
190-199	21	3	37	2
200-209	16	2	56	3
210-219	20	3	26	1
220-229	12	2	20	1
230-239	0	0	6	0
240-249	0	0	12	1
250-299	9	1	48	3
300-399	3	0	105	6
400-499	18	2	263	15
500-599	3	0	136	8
600 and over	1	0	8	0
Ambiguous	3	0	7	0
No response	33	4	70	4

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Average Instrument Approach Speed</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
60-69 knots	8	1%	11	1%
70-79	30	4	52	3
80-89	79	11	131	7
90-99	166	22	233	13
100-109	188	25	282	16
110-119	88	12	162	9
120-129	88	12	289	16
130-139	30	4	199	11
140-149	14	2	170	10
150-159	5	1	59	3
160-169	4	1	36	2
170-179	1	0	24	1
180-189	1	0	15	1
190-199	0	0	5	0
200 or more	0	0	13	1
Ambiguous	1	0	11	1
No response	36	5	75	4

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Communications Equipment</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
360 channel transceiver				
one	277	37%	629	36%
two	408	55	624	47
no response	54	7	314	18
90 channel transceiver				
one	233	32%	357	20%
two	28	4	79	4
no response	478	65	1331	75
Other VHF transceiver				
one	98	13%	378	21%
two	127	17	263	15
ambiguous	0	0	1	0
no response	514	70	1125	64
Other VHF transmitter				
one	50	7%	184	10%
two	132	18	280	16
no response	557	75	1303	74

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Navigation Equipment</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
VOR/LOC receiver				
one	202	27%	539	31%
two	507	69	1013	57
ambiguous	1	0	2	0
no response	29	4	213	12
VOR only receiver				
one	127	17%	243	14%
two	33	4	68	4
no response	579	78	1456	82
Glide slope receiver				
one	364	49%	705	40%
two	126	17	465	26
ambiguous	1	0	3	0
no response	248	34	594	34
Report having:				
ADF	659	89%	1485	84%
RMI	148	20	838	47
marker beacon	683	92	1543	87
transponder	471	64	1333	75
DME	350	47	1129	64
course line computer	39	5	347	20

* Total = 739

** Total = 1767

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Special Equipment</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Report having:				
pitot heat	684	93%	1662	94%
control surface anti- or de-icing	149	20	693	39
propeller anti-icing	218	29	530	30
windshield anti-icing	155	21	838	47
weather radar	104	14	645	37
autopilot capability				
roll	433	59	1122	63
pitch	340	46	1010	57
altitude	273	37	909	51
approach coupler	178	24	628	36
headset mounted microphone	250	34	855	48
oxygen	263	36	1038	59
cabin pressurization	59	8	643	36
other	49	7	209	12

* Total = 739

** Total = 1767

HOW INSTRUMENT AIRPLANE
IS MOST OFTEN OBTAINED

<u>How Airplane Obtained</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Sole owner	125	17%	161	9%
Part owner (not club)	69	9	92	5
Club member	60	8	84	5
Borrowed	17	2	27	2
Company owned	335	45	647	37
Rent	95	13	139	8
Military	7	1	534	30
Ambiguous	31	4	68	4
No response	0	0	15	1

* Total = 739

** Total = 1747

RESPONDENT INVOLVEMENT
IN AIRCRAFT SELECTION

<u>Respondent Involvement</u> (1)	<u>General Avn IFR</u> <u>Number</u> (2)	<u>% of</u> <u>Total*</u> (3)	<u>Total</u>	
			<u>Number</u> (4)	<u>% of</u> <u>Total**</u> (5)
None	177	24%	739	42%
Little	45	6	160	9
Some	127	17	271	15
Much	388	52	570	32
Ambiguous	0	0	4	0
No response	2	0	23	1

* Total = 739

** Total = 1767

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Private Pilot Certificate</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1920-1929	5	1%	5	0%
1930-1939	30	4	50	3
1940-1944	61	8	117	7
1945-1949	92	12	148	8
1950-1954	46	6	95	5
1955-1959	90	12	222	13
1960	28	4	60	3
1961	22	3	64	4
1962	24	3	56	3
1963	29	4	68	4
1964	42	6	91	5
1965	64	9	113	6
1966	74	10	119	7
1967	50	7	86	5
1968	10	1	22	1
1969	1	0	2	0
Ambiguous	1	0	1	0
No response	70	9	448	25

* Total = 739

** Total = 1767

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Commercial Pilot Certificate</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1920-1929	2	0%	2	0%
1930-1939	10	1	15	1
1940-1944	47	6	78	4
1945-1949	81	11	188	11
1950-1954	28	4	77	4
1955-1959	52	7	225	13
1960	12	2	52	3
1961	16	2	54	3
1962	17	2	60	3
1963	20	3	67	4
1964	25	3	82	5
1965	47	6	128	7
1966	77	10	198	11
1967	78	11	195	11
1968	85	12	159	9
1969	10	1	15	1
Ambiguous	0	0	1	0
No response <u>1/</u>	132	18	171	10

1/ Includes those airmen who do not have the commercial pilot certificate.

* Total = 739

** Total = 1767

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Instrument Rating</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1930-1939	4	1%	8	0%
1940-1944	30	4	61	3
1945-1949	47	6	111	6
1950-1954	28	4	89	5
1955-1959	56	8	241	14
1960	17	2	64	4
1961	17	2	61	3
1962	17	2	63	4
1963	20	3	63	4
1964	32	4	102	6
1965	48	6	135	8
1966	92	12	207	12
1967	135	18	249	14
1968	178	24	276	16
1969	9	1	12	1
Ambiguous	1	0	5	0
No response	8	1	20	1

* Total = 739

** Total = 1767

HOW INSTRUMENT RATING OBTAINED

<u>How Rating Obtained</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Completion of required FAA tests and experience	451	61%	646	37%
Graduate of approved flying school	170	23	278	16
Military competence	103	14	774	44
Ambiguous	13	2	64	4
No response	2	0	5	0

* Total = 739

** Total = 1767

CERTIFICATES AND RATINGS HELD

<u>Certificates & Ratings</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Single engine	675	91%	1520	86%
Multiengine	569	77	1344	76
ATR <u>1/</u>	58	8	135	8
Helicopter	33	4	151	9
Flight instructor airplane	320	43	519	29
instrument	203	27	318	18
Ground instructor advanced	117	16	171	10
instrument	100	14	140	8

1/ The ATR certificate was obtained by these airmen after January 1, 1969. Since most of these airmen had been ATR pilots for less than one year, they were left in the analysis.

* Total = 739

** Total = 1767

FLIGHT TIME

<u>Total Time</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
200-299 hours	7	1%	12	1%
300-399	23	3	35	2
400-499	27	4	40	2
500-599	29	4	39	2
600-699	23	3	35	2
700-799	29	4	44	2
800-899	28	4	50	3
900-999	20	3	37	2
1000-1199	30	4	68	4
1200-1399	41	6	76	4
1400-1599	41	6	94	5
1600-1799	26	4	61	3
1800-1999	23	3	51	3
2000-2199	47	6	104	6
2200-2399	21	3	58	3
2400-2599	26	4	72	4
2600-2799	23	3	53	3
2800-2999	8	1	42	2
3000-3999	57	8	230	13
4000-4999	35	5	162	9
5000-5999	34	5	112	6
6000-6999	22	3	74	4
7000-7999	26	4	56	3
8000-8999	16	2	30	2
9000-9999	10	1	14	1
10000-14999	44	6	71	4
15000-19999	10	1	15	1
20000 or more	7	1	17	1
Ambiguous	0	0	2	0
No response	6	1	13	1

* Total = 739

** Total = 1767

FLIGHT TIME

<u>Pilot in Command Time</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99	0	0%	6	0%
100-199	10	1	20	1
200-299	17	2	40	2
300-399	37	5	68	4
400-499	27	4	69	4
500-599	32	4	63	4
600-699	32	4	64	4
700-799	25	3	53	3
800-899	26	3	55	3
900-999	17	2	45	3
1000-1199	39	5	93	5
1200-1399	42	6	103	6
1400-1599	37	5	111	6
1600-1799	20	3	60	3
1800-1999	32	4	84	5
2000-2199	29	4	91	5
2200-2399	18	2	37	2
2400-2599	32	4	69	4
2600-2799	9	1	32	2
2800-2999	13	2	36	2
3000-3999	54	7	185	10
4000-4999	37	5	111	6
5000-5999	31	4	75	4
6000-6999	15	2	27	2
7000-7999	14	2	25	1
8000-8999	21	3	28	2
9000-9999	13	2	16	1
10000-14999	28	4	36	2
15000-19999	8	1	14	1
20000 or more	4	1	11	1
Ambiguous	0	0	0	0
No response	20	3	40	2

* Total = 739

** Total = 1767

FLIGHT TIME

<u>Co-Pilot Time</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99	254	34%	403	23%
100-199	50	7	110	6
200-299	37	5	98	6
300-399	27	4	60	3
400-499	18	2	73	4
500-599	30	4	92	5
600-699	8	1	38	2
700-799	4	1	40	2
800-899	7	1	42	2
900-999	6	1	35	2
1000-1199	23	3	116	7
1200-1399	7	1	60	3
1400-1599	10	1	74	4
1600-1799	7	1	24	1
1800-1999	0	0	25	1
2000-2499	10	1	64	4
2500-2999	5	1	29	2
3000-3999	4	1	39	2
4000-4999	1	0	9	1
5000-5999	2	0	7	0
6000 or more	0	0	10	1
Ambiguous			317	18
No response	229	31	2	0

* Total = 739

** Total = 1767

FLIGHT TIME

<u>Total Time Last 12 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19	31	4%	146	8%
20-39	29	4	66	4
40-59	52	7	72	4
60-79	54	7	67	4
80-99	18	2	35	2
100-149	82	11	185	10
150-199	48	6	96	5
200-249	62	8	146	8
250-299	35	5	76	4
300-349	53	7	119	7
350-399	28	4	54	3
400-449	37	5	115	7
450-499	18	2	43	2
500-599	51	7	136	8
600-699	34	5	111	6
700-799	22	3	77	4
800-899	24	3	79	4
900-999	7	1	40	2
1000-1099	21	3	44	2
1100-1199	10	1	14	1
1200-1299	5	1	6	0
1300-1399	3	0	3	0
1400-1499	2	0	3	0
1500 or more	4	1	5	0
Ambiguous	0	0	1	0
No response	9	1	28	2

* Total = 739

** Total = 1767

HOW OFTEN THE RESPONDENTS FLY
ON THE AVERAGE

<u>Frequency</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Visual flight rules				
less than once				
per month	33	4%	234	13%
about monthly	66	9	154	9
about every other				
week	124	17	216	12
about once per week	138	19	246	14
more than once				
per week	353	48	690	39
ambiguous	3	0	3	0
no response	22	3	224	13
Instrument flight rules				
less than once				
per month	201	27	399	23
about monthly	163	22	249	14
about every other				
week	128	17	248	14
about once per week	91	12	220	12
more than once				
per week	145	20	588	33
ambiguous	1	0	6	0
no response	10	1	57	3

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Total in Last 6 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	68	9%	241	14%
1	9	1	11	1
2	15	2	25	1
3	13	2	19	1
4	20	3	30	2
5	16	2	30	2
6	47	6	65	4
7	23	3	29	2
8	35	5	46	3
9	17	2	24	1
10	62	8	107	6
11	9	1	14	1
12	28	4	55	3
13	4	1	14	1
14	7	1	14	1
15-19	60	8	139	8
20-24	67	9	131	7
25-29	35	5	96	5
30-34	42	6	106	6
35-39	9	1	35	2
40-44	18	2	46	3
45-49	7	1	28	2
50-54	24	3	69	4
55-59	6	1	14	1
60 or more	30	4	154	9
Ambiguous	4	1		
No response	64	9	223	13

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Total in Last 12 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	23	3%	160	9%
1	9	1	14	1
2	9	1	15	1
3	11	1	19	1
4	12	2	15	1
5	12	2	20	1
6	12	2	17	1
7	10	1	12	1
8	6	1	10	1
9	11	1	15	1
10	28	4	41	2
11	7	1	7	0
12	26	4	36	2
13	8	1	10	1
14	16	2	18	1
15-19	67	9	87	5
20-24	60	8	123	7
25-29	46	6	82	5
30-34	50	7	106	6
35-39	18	2	51	3
40-44	42	6	76	4
45-49	18	2	43	2
50-54	40	5	106	6
55-59	4	1	17	1
60-69	24	3	77	4
70-79	29	4	64	4
80-89	12	2	43	2
90-99	6	1	23	1
100 or more	61	8	242	14
Ambiguous	3	0	4	0
No response	59	8	214	12

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Total</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours <u>1/</u>	32	4%	77	4%
20-39 <u>1/</u>	30	4	49	3
40-59	44	6	82	5
60-79	70	9	112	6
80-99	60	8	87	5
100-119	60	8	80	5
120-139	45	6	70	4
140-159	37	5	62	3
160-179	20	3	40	2
180-199	22	3	35	2
200-219	28	4	69	4
220-239	9	1	19	1
240-259	17	2	42	2
260-279	9	1	17	1
280-299	11	1	17	1
300-399	41	6	136	8
400-499	36	5	116	7
500-599	19	3	79	4
600-699	12	2	67	4
700-799	14	2	47	3
800-899	10	1	45	3
900-999	4	1	29	2
1000 or more	46	6	200	11
Ambiguous	3	0	4	0
No response	60	8	186	11

1/ These are incorrect responses since FAR 61.35 requires a minimum of 40 hours instrument time and FAR 141.65 requires a minimum of 30 hours instrument time for instrument rating certification.

* Total = 739

** Total = 1767

INSTRUMENT TIME

Actual Instrument in an Airplane in Last 6 Months (1)	General Avn IFR		Total	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
0 hours	92	12%	253	14%
1	39	5	57	3
2	50	7	81	5
3	38	5	65	4
4	34	5	55	3
5	35	5	93	5
6	28	4	49	3
7	6	1	17	1
8	29	4	46	3
9	7	1	12	1
10	54	7	125	7
11	5	1	14	1
12	14	2	33	2
13	3	0	6	0
14	4	1	5	0
15-19	58	8	146	8
20-24	49	7	110	6
25-29	33	4	81	5
30-34	28	4	71	4
35-39	7	1	25	1
40-44	12	2	34	2
45-49	2	0	10	1
50-54	17	2	56	3
55-59	3	0	7	0
60 or more	30	4	106	6
Ambiguous			3	0
No response	62	8	207	12

* Total = 739

** Total = 1767

INSTRUMENT TIME

Actual Instrument in an Airplane in Last 12 Months (1)	General Avn IFR		Total	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
0 hours	53	7%	185	10%
1	22	3	37	2
2	37	5	44	2
3	23	3	39	2
4	20	3	29	2
5	32	4	53	3
6	27	4	38	2
7	16	2	25	1
8	20	3	34	2
9	12	2	22	1
10	27	4	67	4
11	5	1	13	1
12	16	2	31	2
13	4	1	10	1
14	11	1	24	1
15-19	48	6	88	5
20-24	52	7	120	7
25-29	32	4	82	5
30-34	36	5	94	5
35-39	14	2	41	2
40-44	41	6	76	4
45-49	16	2	33	2
50-54	23	3	72	4
55-59	3	0	5	0
60-69	16	2	62	4
70-79	17	2	43	2
80-89	13	2	31	2
90-99	8	1	18	1
100 or more	40	5	160	9
Ambiguous	3	0	3	0
No response	52	7	188	11

* Total = 739

** Total = 1767

INSTRUMENT TIME

Actual Instrument in an Airplane Total	General Avn IFR		Total	
	Number	% of Total*	Number	% of Total**
(1)	(2)	(3)	(4)	(5)
0-19 hours	151	20%	269	15%
20-39	99	13	170	10
40-59	60	8	112	6
60-79	50	7	92	5
80-99	38	5	63	4
100-119	40	5	90	5
120-139	22	3	48	3
140-159	19	3	55	3
160-179	18	2	36	2
180-199	5	1	24	1
200-219	24	3	87	5
220-239	9	1	19	1
240-259	16	2	48	3
260-279	5	1	17	1
280-299	2	0	11	1
300-399	26	4	111	6
400-499	24	3	79	4
500-599	11	1	61	3
600-699	10	1	45	3
700-799	6	1	26	1
800-899	5	1	28	2
900-999	4	1	15	1
1000 or more	30	4	109	6
Ambiguous	4	1	6	0
No response	61	8	146	8

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Simulated Instrument in Last 6 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	198	27%	459	26%
1	40	5	66	4
2	43	6	79	4
3	43	6	69	4
4	37	5	75	4
5	60	8	128	7
6	34	5	69	4
7	13	2	29	2
8	15	2	38	2
9	4	1	18	1
10	30	4	120	7
11	3	0	9	1
12	7	1	26	1
13	2	0	9	1
14	2	0	6	0
15-19	19	3	59	3
20-24	17	2	49	3
25-29	6	1	26	1
30-34	5	1	24	1
35-39	1	0	6	0
40-44	3	0	14	1
45-49	1	0	4	0
50-54	2	0	7	0
55-59	1	0	2	0
60 or more	3	0	16	1
Ambiguous			4	0
No response	150	20	356	20

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Simulated Instrument in Last 12 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	130	18%	324	18%
1	22	3	43	2
2	43	6	87	5
3	31	4	47	3
4	28	4	52	3
5	32	4	59	3
6	26	4	48	3
7	20	3	32	2
8	27	4	44	2
9	10	1	21	1
10	60	8	137	8
11	6	1	11	1
12	36	5	55	3
13	3	0	14	1
14	3	0	16	1
15-19	35	5	107	6
20-24	36	5	123	7
25-29	7	1	31	2
30-34	13	2	42	2
35-39	5	1	22	1
40-44	8	1	27	2
45-49	4	1	11	1
50-54	6	1	24	1
55-59	1	0	5	0
60 or more	10	1	62	4
Ambiguous			2	0
No response	137	19	321	18

* Total = 739

** Total = 1767

INSTRUMENT TIME

Simulated Instrument Total (1)	General Avn IFR		Total	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
0-19 hours	84	11%	157	9%
20-39	97	13	178	10
40-59	175	24	300	17
60-79	92	12	167	9
80-99	49	7	103	6
100-119	41	6	131	7
120-139	17	2	47	3
140-159	15	2	67	4
160-179	9	1	25	1
180-199	6	1	18	1
200-299	36	5	157	9
300-399	13	2	84	5
400-499	7	1	49	3
500 or more	13	2	96	5
Ambiguous			9	1
No response	85	12	179	10

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Ground Trainer in Last 6 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	381	52%	768	43%
1	10	1	20	1
2	12	2	62	4
3	13	2	28	2
4	4	1	83	5
5	13	2	54	3
6	5	1	39	2
7	6	1	11	1
8	2	0	23	1
9	0	0	2	0
10-14	8	1	78	4
15 or more	3	0	64	4
Ambiguous	2	0	5	0
No response	280	38	530	30

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Ground Trainer in Last 12 Months</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	338	46%	642	36%
1	15	2	21	1
2	15	2	50	3
3	10	1	22	1
4	12	2	65	4
5	16	2	43	2
6	8	1	34	2
7	7	1	10	1
8	2	0	59	3
9	2	0	7	0
10-14	23	3	135	8
15 or more	17	2	171	10
Ambiguous	1	0	3	0
No response	273	37	505	29

* Total = 739

** Total = 1767

INSTRUMENT TIME

<u>Ground Trainer Total</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours	329	45%	497	28%
20-39	93	13	220	12
40-59	43	6	208	12
60-79	19	3	96	5
80-99	10	1	45	3
100-119	19	3	114	6
120-139	5	1	40	2
140-159	9	1	51	3
160-179	3	0	18	1
180-199	0	0	4	0
200-299	18	2	96	5
300-399	7	1	45	3
400-499	2	0	9	1
500 or more	6	1	20	1
Ambiguous	3	0	6	0
No response	173	23	298	17

* Total = 739

** Total = 1767

WHY RESPONDENT HAS NOT BEEN PILOT IN COMMAND
IN ACTUAL INSTRUMENT WEATHER CONDITIONS IN LAST SIX MONTHS

<u>Reason Indicated</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Not applicable	459	62%	1027	58%
Wasn't proficient and needed to go IFR	9	1	17	1
didn't need to go IFR	40	5	95	5
Was proficient and didn't need to go IFR	32	4	59	3
Equipment malfunction prevented going IFR	2	0	3	0
Other	45	6	280	16
Ambiguous	5	1	15	1
No response	147	20	271	15

* Total = 739

** Total = 1767

LAST INSTRUMENT DUAL INSTRUCTION OR
INSTRUMENT FLYING EVALUATION RIDE

<u>Year</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Prior to 1950	3	0%	7	0%
1950-1959	16	2	36	2
1960	3	0	7	0
1961	4	1	6	0
1962	3	0	8	0
1963	9	1	17	1
1964	12	2	26	1
1965	21	3	41	2
1966	34	5	63	4
1967	52	7	105	6
1968	158	21	264	15
1969	381	52	1071	61
1970	37	5	101	6
Ambiguous	1	0	1	0
No response	5	1	14	1

* Total = 739

** Total = 1767

ATC FACILITIES VISITED
DURING INSTRUMENT TRAINING

<u>ATC Facilities Visted</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Air route traffic control center	355	48%	866	49%
Approach/departure control facility	463	63	1121	63
Tower	558	75	1285	73
None	119	16	329	19

* Total = 739

** Total = 1767

ACTUAL INSTRUMENT TIME
DURING TRAINING FOR THE INSTRUMENT RATING
CONSIDERED WORTHWHILE

<u>Actual Instrument Time</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	7	1%	22	1%
1	6	1	15	1
2	23	3	50	3
3	20	3	33	2
4	17	2	26	1
5	111	15	240	14
6-9	18	2	35	2
10	182	25	352	20
11-14	1	0	8	0
15	37	5	80	5
16-19	0	0	1	0
20	77	10	183	10
21-24	0	0	1	0
25	27	4	79	4
26-29	1	0	1	0
30-39	37	5	101	6
40-49	47	6	87	5
50-59	28	4	116	7
60 or more	14	2	64	4
Ambiguous	48	6	141	8
No response	38	5	132	7

* Total = 739

** Total = 1767

STATES FROM WHICH IFR FLIGHTS ORIGINATED

<u>State</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Alabama	8	1.1%	34	1.9%
Alaska	2	.3	8	.5
Arizona	5	.7	14	.8
Arkansas	10	1.4	16	.9
California	117	15.8	278	15.7
Colorado	13	1.8	43	2.4
Connecticut	8	1.1	9	.5
Delaware	3	.4	8	.5
District of Columbia	7	.9	25	1.4
Florida	38	5.1	99	5.6
Georgia	13	1.8	41	2.3
Hawaii	0	.0	9	.5
Idaho	2	.3	4	.2
Illinois	32	4.3	84	4.8
Indiana	19	2.6	27	1.5
Iowa	6	.8	9	.5
Kansas	18	2.4	33	1.9
Kentucky	6	.8	8	.5
Louisiana	9	1.2	21	1.2
Maine	1	.1	3	.2
Maryland	8	1.1	27	1.5
Massachusetts	14	1.9	34	1.9
Michigan	28	3.8	41	2.3
Minnesota	20	2.7	46	2.6
Mississippi	4	.5	10	.6
Missouri	15	2.0	31	1.8
Montana	2	.3	3	.2
Nebraska	6	.8	12	.7
Nevada	2	.3	7	.4
New Hampshire	2	.3	3	.2

* Total = 739

** Total = 1767

STATES FROM WHICH IFR FLIGHTS ORIGINATED

<u>State</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
New Jersey	22	3.0%	38	2.2%
New Mexico	8	1.1	14	.8
New York	35	4.7	89	5.0
North Carolina	12	1.6	24	1.4
North Dakota	0	.0	4	.2
Ohio	37	5.0	59	3.3
Oklahoma	16	2.2	29	1.6
Oregon	10	1.4	16	.9
Pennsylvania	22	3.0	41	2.3
Rhode Island	2	.3	4	.2
South Carolina	6	.8	13	.7
South Dakota	5	.7	6	.3
Tennessee	11	1.5	20	1.1
Texas	58	7.8	143	8.1
Utah	4	.5	7	.4
Vermont	1	.1	3	.2
Virginia	7	.9	25	1.4
Washington	19	2.6	47	2.7
West Virginia	2	.3	4	.2
Wisconsin	17	2.3	19	1.1
Wyoming	1	.1	2	.1
Foreign	9	1.2	90	5.1
No response	17	2.3	83	4.7

* Total = 739

** Total = 1767

INSTRUMENT APPROACH MOST OFTEN MADE
AT AIRPORT FROM WHICH
MOST IFR FLIGHTS ORIGINATED

<u>Type of Approach</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS	230	31%	670	38%
LOC	76	10	94	5
VOR	220	30	319	18
ADF	44	6	65	4
Radar vectors	55	7	313	18
None	64	9	101	6
Ambiguous	49	7	174	10
No response	1	0	31	2

* Total = 739

** Total = 1767

TYPE OF INSTRUMENT APPROACH
MOST OFTEN MADE DURING LAST 12 MONTHS

<u>Type of Approach</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS	324	44%	736	42%
LOC	81	11	96	5
VOR	193	26	265	15
ADF	21	3	35	2
Radar vectors	53	7	322	18
None	24	3	174	10
Ambiguous	41	6	102	6
No response	2	0	37	2

* Total = 739

** Total = 1767

TYPE OF FLYING
MOST OFTEN ENGAGED IN
DURING LAST 12 MONTHS

<u>Type of Flying</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
General aviation				
business				
not for hire	177	24%	209	12%
corporate pilot	100	14	110	6
air taxi or charter	76	10	79	4
aerial application	8	1	14	1
industrial/special	13	2	15	1
giving instruction	129	17	144	8
personal	200	27	275	16
Airline	5	1	258	15
Military	8	1	461	26
Ambiguous	10	1	83	5
No response	13	2	119	7

* Total = 739

** Total = 1767

TYPE OF IFR FLYING
MOST OFTEN ENGAGED IN
DURING LAST 12 MONTHS

<u>Type of IFR Flying</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
General aviation				
business				
not for hire	207	28%	207	12%
corporate pilot	120	16	120	7
air taxi or charter	108	15	108	6
aerial application	0	0	0	0
industrial/special	9	1	9	1
giving instruction	84	11	84	5
personal	211	29	211	12
Airline	0 1/	0	260	15
Military	0 1/	0	465	26
Ambiguous	0 1/	0	47	3
No response	0 1/	0	256	14

1/ The definition of general aviation IFR requires Col. (2) to be zero.

* Total = 739

** Total = 1767

FLIGHT INFORMATION PUBLICATIONS
USUALLY TAKEN ON AN IFR FLIGHT

<u>Publication</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Airman's Information Manual				
Part I	253	34%	368	21%
Part II	203	27	304	17
Part III	253	34	357	20
USC & GS charts				
Enroute low altitude	388	52	672	38
Enroute high altitude	32	4	189	11
Instrument approach	365	49	648	37
SIDs	173	23	356	20
Jeppesen Airway Manual Service				
Complete	233	32	509	29
Standard	126	17	226	13
Military charts	66	9	630	36
Other	49	7	147	8
Are usually current	455	62	1004	57

* Total = 739
** Total = 1767

FACTOR CAUSING CANCELLATION OF AN INTENDED IFR FLIGHT
JUST BEFORE PLANNED DEPARTURE DURING LAST 12 MONTHS

<u>Factor</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Had no need to cancel	255	35%	660	37%
Weather				
worse than published minimums	62	8	219	12
beyond personal limitations	115	16	149	8
beyond aircraft/ equipment capability	182	25	294	17
Equipment malfunction	30	4	147	8
Lack of adequate flight weather information and/or publications	5	1	5	0
Factors unrelated to aircraft, equipment, or weather	22	3	43	2
Other	31	4	125	7
Ambiguous	34	5	68	4
No response	3	0	57	3

* Total = 739

** Total = 1767

PERSONAL WEATHER MINIMUMS

<u>ILS Personal Minimums</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	1	0%	5	0%
100-199	6	1	35	2
200-299	62	8	186	11
300-399	46	6	83	5
400-499	44	6	60	3
500-599	52	7	80	5
600-699	15	2	18	1
700-799	1	0	3	0
800-899	14	2	17	1
900-999	0	0	0	0
1000-1099	9	1	14	1
1100 or more	3	0	4	0
ambiguous	3	0	5	0
no response	483 <u>1/</u>	65	1257	71
Visibility				
1/4 mile	13	2	36	2
1/2	68	9	168	10
3/4	48	6	74	4
1	108	15	167	9
1 1/4	0	0	0	0
1 1/2	2	1	15	1
1 3/4	0	0	0	0
2	27	4	36	2
ambiguous	28	4	91	5
no response	33	4	97	5
Always use published minimums <u>2/</u>	330	45	872	49
Seldom make this approach <u>3/</u>	76	10	211	12

1/ Includes respondents who answer 2/ or 3/

* Total = 739

** Total = 1767

PERSONAL WEATHER MINIMUMS

<u>LOC Personal Minimums</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	1	0%	2	0%
100-199	0	0	0	0
200-299	7	1	31	2
300-399	32	4	72	4
400-499	64	9	108	6
500-599	67	9	110	6
600-699	18	2	26	1
700-799	7	1	10	1
800-899	29	4	38	2
900-999	0	0	0	0
1000-1099	11	1	21	1
1100 or more	4	1	5	0
ambiguous	1	0	2	0
no response	498 <u>1/</u>	67	1342	76
Visibility				
1/4 mile	1	0	3	0
1/2	33	4	61	3
3/4	36	5	66	4
1	137	19	221	13
1 1/4	4	1	5	0
1 1/2	17	2	23	1
1 3/4	0	0	0	0
2	28	4	48	3
ambiguous	30	4	72	4
no response	48	6	142	8
Always use published minimums <u>2/</u>	333	45	862	49
Seldom make this approach <u>3/</u>	72	10	264	15

1/ Includes respondents who answer 2/ or 3/

* Total = 739

** Total = 1767

PERSONAL WEATHER MINIMUMS

<u>VOR Personal Minimums</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	1	0%	1	0%
100-199	0	0	1	0
200-299	2	0	9	1
300-399	10	1	32	2
400-499	33	4	84	5
500-599	80	11	146	8
600-699	31	4	47	3
700-799	8	1	15	1
800-899	36	5	51	3
900-999	3	0	3	0
1000-1099	38	5	54	3
1100 or more	6	1	8	0
ambiguous	1	0	2	0
no response	490 <u>1/</u>	66	1314	74
Visibility				
1/4 mile	0	0	1	0
1/2	16	2	33	2
3/4	19	3	40	2
1	146	20	261	15
1 1/4	2	0	4	0
1 1/2	29	4	38	2
1 3/4	2	0	2	0
2	51	7	81	5
ambiguous	26	4	68	4
no response	41	6	118	7
Always use published minimums <u>2/</u>	376	51	985	56
Seldom make this approach <u>3/</u>	31	4	136	8

1/ Includes respondents who answer 2/ or 3/

* Total = 739

** Total = 1767

PERSONAL WEATHER MINIMUMS

<u>ADF Personal Minimums</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	0	0%	0	0%
100-199	0	0	0	0
200-299	1	0	3	0
300-399	3	0	13	1
400-499	16	2	56	3
500-599	59	8	116	7
600-699	30	4	39	2
700-799	9	1	13	1
800-899	28	4	42	2
900-999	4	1	4	0
1000-1099	29	4	48	3
1100 or more	3	0	6	0
ambiguous	2	0	4	0
no response	555 <u>1/</u>	75	1423	81
Visibility				
1/4 mile	0	0	0	0
1/2	5	1	12	1
3/4	6	1	21	1
1	106	14	188	11
1 1/4	1	0	3	0
1 1/2	18	2	32	2
1 3/4	1	0	1	0
2	38	5	65	4
ambiguous	35	5	84	5
no response	52	7	144	8
Always use published minimums <u>2/</u>	260	35	745	42
Seldom make this approach <u>3/</u>	217	29	472	27

1/ Includes respondents who answer 2/ or 3/.

* Total = 739

** Total = 1767

WEATHER GO/NO GO DECISION,
WEATHER REPORTED TO EXIST ANYWHERE ENROUTE

<u>Weather Decision</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Icing				
light				
not go	145	20%	239	14%
probably not go	165	22	273	15
probably go	235	32	396	22
go	187	25	830	47
ambiguous	2	0	4	0
no response	5	1	25	1
moderate				
not go	409	55	691	39
probably not go	163	22	300	17
probably go	104	14	313	18
go	51	7	425	24
ambiguous	2	0	4	0
no response	10	1	34	2
heavy				
not go	639	86	1223	69
probably not go	64	9	238	13
probably go	17	2	137	8
go	7	1	133	8
ambiguous	5	1	10	1
no response	7	1	26	1

* Total = 739

** Total = 1767

WEATHER GO/NO GO DECISION,
WEATHER REPORTED TO EXIST ANYWHERE ENROUTE

<u>Weather Decision</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Thunderstorms				
scattered				
not go	34	5%	58	3%
probably not go	79	11	123	7
probably go	320	43	540	31
go	295	40	1011	57
ambiguous	2	0	3	0
no response	9	1	32	2
broken				
not go	125	17	212	12
probably not go	248	34	409	23
probably go	231	31	534	30
go	112	15	564	32
ambiguous	2	0	4	0
no response	21	3	44	2
lines				
not go	437	59	740	42
probably not go	186	25	424	24
probably go	75	10	293	17
go	33	4	277	16
ambiguous	1	0	4	0
no response	7	1	29	2
Heavy ground fog				
not go	277	37	553	31
probably not go	117	16	271	15
probably go	188	25	433	25
go	146	20	471	27
ambiguous	0	0	4	0
no response	11	1	35	2

* Total = 739

** Total = 1767

DECISION TO FILE AN IFR FLIGHT PLAN
BEFORE DEPARTURE DURING THE DAYTIME
BY DESTINATION WEATHER FORECAST

<u>Decision to File IFR</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Good VFR <u>1/</u>				
almost never	232	31%	379	21%
seldom	199	27	303	17
often	177	24	328	19
almost always	122	17	695	39
never had experience	6	1	23	1
ambiguous	0	0	3	0
no response	3	0	36	2
VFR <u>2/</u>				
almost never	73	10	134	8
seldom	121	16	198	11
often	224	30	383	22
almost always	312	42	988	56
never had experience	6	1	23	1
ambiguous	1	0	4	0
no response	2	0	37	2
IFR <u>3/</u>				
almost never	21	3	36	2
seldom	34	5	73	4
often	40	5	77	4
almost always	605	82	1462	83
never had experience	31	4	68	4
ambiguous	3	0	8	0
no response	5	1	43	2

1/ ceiling better than 5000 ft., visibility better than 5 miles.

2/ ceiling 1000 to 5000 ft., visibility 3 to 5 miles.

3/ ceiling less than 1000 ft., visibility less than 3 miles

* Total = 739

** Total = 1767

DECISION TO CANCEL AN IFR FLIGHT PLAN
AS SOON AS REACHING VFR CONDITIONS
AFTER DEPARTING AN AIRPORT IN IFR WEATHER

<u>Decision to Cancel</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	257	35%	887	50%
Seldom	233	32	391	22
Often	158	21	265	15
Almost always	63	9	108	6
Never had experience	26	4	89	5
Ambiguous	0	0	5	0
No response	2	0	22	1

* Total = 739

** Total = 1767

DECISION TO FILE AN IFR FLIGHT PLAN
BEFORE DEPARTING ON A FLIGHT
TO BE CONDUCTED ENTIRELY DURING THE DAYTIME
IN GOOD VFR CONDITIONS

<u>Decision to File</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	177	24%	294	17%
Seldom	241	33	371	21
Often	213	29	423	24
Almost always	95	13	616	35
Never had experience	9	1	33	2
Ambiguous	0	0	8	0
No response	4	1	22	1

* Total = 739

** Total = 1767

DECISION TO FILE AN IFR FLIGHT PLAN
IN FLIGHT

<u>Decision to File</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	125	17%	433	25%
Seldom	350	47	797	45
Often	219	30	375	21
Almost always	11	1	40	2
Never had experience	32	4	103	6
Ambiguous	1	0	4	0
No response	1	0	15	1

* Total = 739

** Total = 1767

AVERAGE PERCENT OF TIME ON INSTRUMENT FLIGHT PLANS
IN ACTUAL INSTRUMENT CONDITIONS

<u>Percent</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-4	36	5%	121	7%
5-9	72	10	226	13
10-14	144	19	439	25
15-19	58	8	142	8
20-24	107	14	243	14
25-29	58	8	132	7
30-34	72	10	119	7
35-39	4	1	8	0
40-44	23	3	37	2
45-49	4	1	6	0
50-54	70	9	111	6
55-59	0	0	0	0
60-64	11	1	21	1
65-69	4	1	4	0
70-74	12	2	15	1
75-79	13	2	24	1
80-84	11	1	16	1
85-89	2	0	2	0
90-94	11	1	15	1
95-100	6	1	7	0
Ambiguous	12	1	40	2
No response	9	1	39	2

* Total = 739

** Total = 1767

ACTUAL INSTRUMENT APPROACH
MADE DURING LAST 12 MONTHS

<u>Actual Instrument Approach</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Was an approach made?				
yes	610	83%	1405	80%
no	114	15	327	19
ambiguous	0	0	1	0
no response	15	2	34	2
Lowest type of approach made				
ILS	348	47	733	41
LOC	72	10	81	5
VOR	94	13	120	7
ADF	21	3	27	2
Radar	39	5	315	18
Ambiguous	44	6	134	8
No response <u>1/</u>	121	16	357	20

1/ The respondents who did not have to make an actual instrument approach in the last 12 months were asked not to answer this part of the question.

* Total = 739

** Total = 1767

LOWEST ACTUAL INSTRUMENT APPROACH
MADE IN THE LAST 12 MONTHS

<u>Lowest Approach Made</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	5	1%	12	1%
100-199	18	2	119	7
200-299	163	22	519	29
300-399	72	10	198	11
400-499	88	12	141	8
500-599	64	9	113	6
600-699	46	6	58	3
700-799	26	4	33	2
800-899	46	6	64	4
900-999	13	2	18	1
1000-1099	24	3	31	2
1100 or more	13	2	21	1
ambiguous	12	2	20	1
no response <u>1/</u>	149	20	420	24
Visibility				
1/4 mile	37	5	184	10
1/2	196	27	582	33
3/4	88	12	169	10
1	166	22	277	16
1 1/4	14	2	20	1
1 1/2	43	6	73	4
1 3/4	3	0	4	0
2	66	9	100	6
ambiguous	2	0	2	0
no response <u>1/</u>	124	17	356	20

1/ The respondents who did not have to make an actual instrument approach in the last 12 months were asked not to answer this part of the question.

* Total = 739

** Total = 1767

RADIUS FROM HOME AIRPORT
MOST OFTEN OPERATE IFR

<u>Radius</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99 nm	73	10%	168	10%
100-199	126	17	241	14
200-299	129	17	243	14
300-399	124	17	200	11
400-499	54	7	76	4
500-599	91	12	189	11
600-699	27	4	60	3
700-799	8	1	23	1
800-899	16	2	35	2
900-999	3	0	10	1
1000-1499	43	6	160	9
1500-1999	12	2	69	4
2000-2499	4	1	80	5
2500-2999	2	0	18	1
3000 or more	2	0	52	3
Ambiguous	3	0	13	1
No response	22	3	130	7

* Total = 739

** Total = 1767

ONE WAY DISTANCE OF LONGEST NONSTOP FLIGHT
ON AN IFR FLIGHT PLAN AS PILOT IN COMMAND
DURING LAST 12 MONTHS

<u>Distance</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99 nm	61	8%	172	10%
100-199	69	9	107	6
200-299	92	12	134	8
300-399	100	14	139	8
400-499	82	11	122	7
500-599	64	9	103	6
600-699	71	10	118	7
700-799	45	6	77	4
800-899	41	6	81	5
900-999	23	0	56	3
1000-1499	46	6	187	11
1500-1999	9	1	76	4
2000-2499	9	1	67	4
2500-2999	1	0	49	3
3000 or more	3	0	94	5
Ambiguous	1	0	4	9
No response	22	3	181	1

* Total = 739

** Total = 1767

NUMBER OF TIMES HELD OR EXECUTED MISSED APPROACH
DURING LAST 12 MONTHS

<u>Number of Times</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Had to hold				
0	249	34%	479	27%
1	92	12	153	9
2	108	15	214	12
3	54	7	108	6
4	24	3	66	4
5-9	76	10	205	12
10-14	46	6	157	9
15-19	15	2	58	3
20-24	11	1	65	4
25 or more	18	2	92	5
Ambiguous	20	3	41	2
No response	26	4	129	7

Had to execute a missed approach

0	510	69%	1027	58%
1	97	13	257	15
2	44	6	153	9
3	13	2	59	3
4	5	1	20	1
5-9	14	2	46	3
10-14	5	1	20	1
15-19	0	0	4	0
20-24	0	0	3	0
25 or more	1	0	7	0
Ambiguous	2	0	10	1
No response	48	6	161	9

* Total = 739

** Total = 1767

NUMBER OF TIMES REROUTED OR DIVERTED TO ALTERNATE
DURING LAST 12 MONTHS

<u>Number of Times</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Rerouted				
0	197	27%	458	26%
1	89	12	167	9
2	82	11	168	10
3	56	8	119	7
4	34	5	69	4
5-9	95	13	234	13
10-14	64	9	166	9
15-19	9	1	34	2
20-24	18	2	48	3
25 or more	29	4	94	5
Ambiguous	33	4	64	4
No response	33	4	146	8
Had to divert to an alternate				
0	531	72	1101	62
1	98	13	259	15
2	41	6	119	7
3	7	1	53	3
4	2	0	16	1
5-9	11	1	40	2
10-14	2	0	15	1
15-19	1	0	1	0
20-24	0	0	0	0
25 or more	0	0	0	0
Ambiguous	4	1	8	0
No response	42	6	155	9

* Total = 739

** Total = 1767

DIFFICULTY OF INSTRUMENT APPROACHES

<u>Difficulty Rating</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS				
little	503	68%	1232	70%
some	134	18	267	15
much	19	3	35	2
extreme	8	1	10	1
seldom make	67	9	184	10
ambiguous	1	0	5	0
no response	7	1	34	2
LOC				
little	464	63	967	55
some	164	22	396	22
much	15	2	28	2
extreme	2	0	3	0
seldom make	84	11	329	19
ambiguous	2	0	4	0
no response	8	1	40	2
VOR				
little	523	71	1152	65
some	172	23	453	26
much	13	2	23	1
extreme	2	0	2	0
seldom make	19	3	100	6
ambiguous	4	1	8	0
no response	6	1	29	2
ADF				
little	129	17	325	18
some	274	37	664	38
much	101	14	219	12
extreme	19	3	44	2
seldom make	194	26	451	26
ambiguous	14	2	30	2
no response	8	1	34	2

* Total = 739

**Total = 1767

ASSISTANCE RECEIVED BY PILOT IN COMMAND
DURING AN IFR FLIGHT

<u>Assistance Received</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Frequency of assistance				
almost never	283	38%	480	27%
seldom	192	26	287	16
often	145	20	279	16
almost always	116	16	685	39
ambiguous	0	0	3	0
no response	3	0	33	2
Nature of assistance				
by another pilot				
yes	477	65	1283	73
no	124	17	192	11
ambiguous	0	0	3	0
no response	138	19	289	16
instrument rated				
yes	324	44	1076	61
no	259	35	376	21
ambiguous	1	0	4	0
no response	155	21	311	18
required co-pilot				
yes	121	16	768	43
no	471	64	715	40
ambiguous	0	0	1	0
no response	147	20	283	16

* Total = 739

** Total = 1767

SINGLE ENGINE AIRCRAFT EXPERIENCE

<u>Single Engine Experience</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Actual IFR				
yes	701	95%	1576	89%
no	34	5	175	10
ambiguous	0	0	0	0
no response	4	1	16	1
Night VFR				
yes	710	96	1668	94
no	16	2	67	4
ambiguous	0	0	1	0
no response	13	2	31	2
Night actual IFR				
yes	482	65	1175	66
no	244	33	559	32
ambiguous	1	0	1	0
no response	12	2	32	2

* Total = 739

** Total = 1767

ADEQUACY OF 6 HOURS OF INSTRUMENT EXPERIENCE
 WITHIN PRECEDING 6 CALENDAR MONTHS
 IN MAINTAINING A SAFE LEVEL OF INSTRUMENT PROFICIENCY

<u>Adequacy</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Not adequate	277	37%	851	48%
Adequate	422	57	833	47
More than adequate	36	5	60	3
Ambiguous	0	0	2	0
No response	4	1	21	1

* Total = 739

** Total = 1767

RESPONDENT SELF EVALUATION
OF AERONAUTICAL
SKILL, KNOWLEDGE, EXPERIENCE

<u>Self Evaluation</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Skill level				
1	19	3%	37	2%
new instrument pilot	59	8	104	6
3	166	22	248	14
4	230	31	378	21
professional pilot	228	31	735	42
6	29	4	237	13
ambiguous	0	0	2	0
no response	8	1	26	1
Knowledge level				
1	9	1	23	1
new instrument pilot	46	6	75	4
3	121	16	200	11
4	221	30	355	20
professional pilot	286	39	850	48
6	48	6	237	13
ambiguous	0	0	3	0
no response	8	1	24	1
Experience level				
1	25	3	61	3
new instrument pilot	75	10	117	7
3	215	29	309	17
4	181	24	348	20
professional pilot	190	26	668	38
6	44	6	239	14
ambiguous	1	0	2	0
no response	8	1	23	1

* Total = 739

** Total = 1767

DIFFICULTY OF IFR FLIGHT
General Avn IFR

<u>Departure Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal 1/ minimum ceiling and/or visibility	26	30	117	399	4	163
light or moderate icing	51	139	356	164	1	28
light or moderate turbulence	204	224	208	61	2	40
scattered or broken thunderstorms	43	104	351	207	1	33
strong winds	122	188	268	124	2	35
nonroutine ATC instructions	60	122	319	199	1	38
	99	203	308	86	2	41

Departure Phase IFR Condition (8)	Difficulty					
	little (9)	some (10)	much (11)	extreme (12)	ambig- uous (13)	no response (14)
normal 1/ minimum ceiling and/or visibility	493	27	1	0	3	215
light or moderate icing	459	160	10	1	1	108
light or moderate turbulence	244	184	39	10	3	259
scattered or broken thunderstorms	333	267	28	2	1	108
strong winds	204	281	57	10	1	186
nonroutine ATC instructions	349	236	31	2	1	120
	308	233	35	7	1	155

1/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Total

Departure Phase IFR Condition (1)	Frequency of Encounter					
	never (2)	almost never (3)	seldom (4)	often (5)	ambig- uous (6)	no response (7)
normal <u>L</u> / minimum ceiling and/or visibility	60	60	235	1018	7	387
light or moderate icing	88	307	895	400	2	75
light or moderate turbulence	339	503	626	202	4	93
scattered or broken thunderstorms	85	233	794	571	2	82
strong winds	197	362	734	384	2	88
nonroutine ATC instructions	99	244	727	606	2	89
	172	531	729	228	2	105

<u>Departure Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal <u>L</u> / minimum ceiling and/or visibility	1193	67	2	0	4	501
light or moderate icing	1096	429	23	4	1	214
light or moderate turbulence	844	382	64	15	3	459
scattered or broken thunderstorms	881	612	50	3	2	219
strong winds	602	680	126	22	2	335
nonroutine ATC instructions	861	599	66	3	1	237
	819	540	94	13	3	298

L Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
General Avn IFR

<u>Transition Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal <u>L</u> / minimum ceiling and/or visibility light or moderate icing light or moderate turbulence scattered or broken thunderstorms strong winds nonroutine ATC instructions	22 54 148 37 95 48 98	35 114 214 103 190 105 195	119 329 251 334 281 343 309	384 192 76 213 125 198 83	1 1 2 3 2 2 1	178 49 48 49 46 43 53

<u>Transition Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal <u>L</u> / minimum ceiling and/or visibility	470	38	1	0	1	229
light or moderate icing	472	116	12	0	2	137
light or moderate turbulence	263	209	44	5	2	216
scattered or broken thunderstorms	338	259	25	1	1	115
strong winds	208	286	62	8	1	174
nonroutine ATC instructions	358	226	29	0	1	125
	338	190	35	7	1	168

L/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Total

<u>Transition Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal <u>L</u> /	57	72	226	993	2	417
minimum ceiling and/or visibility	96	259	804	480	1	127
light or moderate icing	253	449	680	262	3	120
light or moderate turbulence	66	214	760	607	3	117
scattered or broken thunderstorms	149	337	756	405	2	118
strong winds	76	194	748	635	2	112
nonroutine ATC instructions	170	511	734	213	1	138

<u>Transition Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal <u>L</u> /	1153	71	2	0	1	530
minimum ceiling and/or vis'bility	1143	304	20	1	2	292
light or moderate icing	872	390	70	7	2	426
light or moderate turbulence	894	581	44	2	1	245
scattered or broken thunderstorms	629	676	120	13	1	328
strong winds	969	482	51	0	1	264
nonroutine ATC instructions	916	433	62	12	1	343

L/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
General Avn IFR

Approach Phase IFR Condition (1)	Frequency of Encounter					
	never (2)	almost never (3)	seldom (4)	often (5)	ambig- uous (6)	no response (7)
normal 1/ minimum ceiling and/or visibility	24	30	117	388	1	179
light or moderate icing	47	160	343	142	2	45
light or moderate turbulence	188	222	225	50	1	53
scattered or broken thunderstorms	44	127	345	172	2	49
strong winds	137	212	270	68	1	51
nonroutine ATC instructions	45	136	353	155	1	49
	110	214	281	75	1	58

<u>Approach Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal <u>L</u> / minimum ceiling and/or visibility light or moderate icing light or moderate turbulence scattered or broken thunderstorms strong winds nonroutine ATC instructions	443 344 236 276 195 258 278	47 242 199 295 255 302 218	1 27 42 45 70 56 56	0 2 8 1 7 5 7	1 1 1 2 1 2 1	247 123 253 120 211 116 179

L/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Total

<u>Approach Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>				
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)
					<u>no response</u> (7)
normal <u>1/</u>	50	65	231	979	1
minimum ceiling and/or visibility	76	329	883	371	3
light or moderate icing	308	506	638	192	1
light or moderate turbulence	83	280	811	474	2
scattered or broken thunderstorms	202	464	738	244	2
strong winds	76	271	796	504	2
nonroutine ATC instructions	198	539	686	199	3

<u>Approach Phase IFR Condition</u> (8)	<u>Difficulty</u>				
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)
					<u>no response</u> (14)
normal <u>1/</u>	1097	108	2	2	1
minimum ceiling and/or visibility	832	615	63	7	1
light or moderate icing	788	418	78	11	1
light or moderate turbulence	701	713	95	3	2
scattered or broken thunderstorms	532	677	164	16	3
strong winds	607	773	132	6	2
nonroutine ATC instructions	742	520	115	17	1

1/ Does not include any of the conditions which follow normal.

ASPECT OF FLYING PERFORMANCE WHICH DETERIORATES FIRST
AS A "NORMAL" IFR FLIGHT BECOMES MORE DIFFICULT
BECAUSE OF IFR CONDITIONS

<u>Aspect of Performance Deteriorating First</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Altitude control	103	14%	200	11%
Heading control	193	26	397	22
Communications	88	12	199	11
Accurate use of enroute & approach charts, etc.	103	14	244	14
Accurately remembering ATC instructions	93	12	261	15
Accurate interpretation of instrument readings	38	5	95	5
Other	75	10	231	13
Ambiguous	20	3	55	3
No response	26	4	85	5

* Total = 739

** Total = 1767

REASON FOR FLYING PERFORMANCE DETERIORATION

<u>Reason</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Lack of actual instrument flying experience	112	15%	178	10%
Unfamiliarity with ATC instructions	19	3	44	2
Difficulty in staying current on latest procedures and information	41	6	89	5
Not enough time to anticipate future tasks	86	12	238	13
Lack of recent instrument flying practice	196	27	406	23
Other	233	32	658	37
Ambiguous	9	1	27	2
No response	43	6	127	7

* Total = 739

** Total = 1767

REPORTED MOST COMMON ERROR MADE BY INSTRUMENT PILOTS

Most Common Error (1)	General Avn IFR		Total	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
Not knowing personal limitations	119	16%	284	16%
Not planning ahead	119	16%	266	15
Allowing skills to deteriorate	63	9	115	7
Misunderstanding ATC instructions	61	8	139	8
Poor instrument scanning	48	6	192	11
Confidence in being able to handle weather	44	6	103	6
Altitude control	22	3	56	3
Not understanding weather	21	3	36	2
Heading control	20	3	29	2
Flying IFR with inadequate equipment	20	3	32	2
Poor communications technique	18	2	39	2
Allowing knowledge to deteriorate	16	2	29	2
Inaccurate use of charts and publications	12	2	40	2
Not scanning for traffic	11	1	19	1
Unclassified	87	12	248	14
None or no response	58	8	140	8

* Total = 739

** Total = 1767

CHANGES SUGGESTED IN THE TRAINING AND REGULATIONS
CONCERNING CERTIFICATION OF NEW INSTRUMENT PILOTS

<u>Suggested Change</u> (1)	<u>General Avn IFR</u>		<u>Total</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Require actual instrument experience	255	35%	424	24%
Require more time before certification	39	5	105	6
Require more simulated instrument	28	4	74	4
Recertify or periodically check instrument pilots	22	3	58	3
Set higher instructional standards	19	3	37	2
More emphasis on instrument approach	16	2	37	2
Issue different categories of instrument ratings	15	2	28	2
More emphasis on A/C procedures	12	2	43	2
More comprehensive flight check	12	2	34	2
More cross country experience	11	1	19	1
More practical and/or realistic written exam	11	1	16	1
Require flight simulator experience	10	1	22	1
Unclassified	128	17	342	19
None or no response	161	22	528	30

* Total = 739

** Total = 1767

REPORTED MOST UNCOMFORTABLE OR THREATENING EXPERIENCE
DURING AN IFR FLIGHT IN ACTUAL IFR CONDITIONS

Experience (1)	General Avn IFR		Total	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
Structural icing	212	29%	331	19%
Thunderstorms	91	12	262	15
Turbulence	41	6	113	6
Communications loss	38	5	82	5
Equipment malfunction	38	5	82	5
Engine failure	28	4	67	4
Feeling behind a situation	25	3	51	3
Deteriorating weather	20	3	77	4
Approach to minimums	20	3	59	3
Spatial disorientation	19	3	73	4
Loss of navigation equipment	18	2	37	2
Near midair and/or unknown traffic	18	2	89	5
Loss of primary flight instruments	13	2	35	2
Communications and navigation loss	13	2	22	1
Unclassified	93	13	257	15
None or no response	52	7	130	7

* Total = 739

** Total = 1767

APPENDIX D
INSTRUMENT PILOT SURVEY
GENERAL AVIATION IFR
DATA BY PROFILE

- NOTES: 1. Appendix D is consecutively numbered in the upper right hand corner with Arabic numerals preceded by the capital letter D. The Arabic numerals correspond to the question with the same number in the Instrument Pilot Survey Questionnaire, presented in Appendix B.
2. Where applicable, percentages will not always add to 100% due to rounding.

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Type of Aircraft</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Single-engine				
1-3 places	51	11%	6	2%
4 places & over	269	56	77	29
Multiengine piston	142	30	133	51
Turboprop	7	1	23	9
Turbojet	3	1	18	7
Ambiguous	4	1	5	2
No response	1	0	0	0
Retractable gear				
yes	287	60	204	78
no	131	27	31	12
ambiguous	2	0	0	0
no response	57	12	27	10
Controllable propeller				
yes	342	72	208	79
no	68	14	19	7
ambiguous	1	0	0	0
no response	66	14	35	13

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Year of Manufacture</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Prior to 1950	11	2%	10	4%
1950-1954	14	3	2	1
1955-1959	60	13	17	6
1960	19	4	8	3
1961	14	3	3	1
1962	17	4	9	3
1963	16	3	7	3
1964	29	6	12	5
1965	40	8	16	6
1966	33	7	29	11
1967	44	9	28	11
1968	81	17	55	21
1969	57	12	43	16
1970	2	0	4	2
Ambiguous	10	2	7	3
No response	30	6	12	5

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Average Cruise Speed</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
80-89 knots	5	1%	0	0%
90-99	10	2	1	0
100-109	27	6	8	3
110-119	30	6	5	2
120-129	41	9	9	3
130-139	65	14	15	6
140-149	60	13	20	8
150-159	52	11	25	10
160-169	55	12	37	14
170-179	31	6	24	9
180-189	40	8	40	15
190-199	10	2	11	4
200-209	4	1	12	5
210-219	6	1	14	5
220-229	5	1	7	3
230-239	0	0	0	0
240-249	0	0	0	0
250-299	4	1	5	2
300-399	1	0	2	1
400-499	2	0	16	6
500-599	1	0	2	1
600 and over	1	0	0	0
Ambiguous	3	1	0	0
No response	24	5	9	3

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Average Instrument Approach Speed</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
60-69 knots	8	2%	0	0%
70-79	25	5	5	2
80-89	62	13	17	6
90-99	137	29	29	11
100-109	120	25	68	26
110-119	48	10	40	15
120-129	35	7	53	20
130-139	8	2	22	8
140-149	3	1	11	4
150-159	3	1	2	1
160-169	1	0	3	1
170-179	1	0	0	0
180-189	1	0	0	0
190-199	0	0	0	0
200 or more	0	0	0	0
Ambiguous	0	0	1	0
No response	25	5	11	4

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Communications Equipment</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
360 channel transceiver				
one	219	46%	58	22%
two	204	43	204	78
no response	54	11	0	0
90 channel transceiver				
one	173	36	60	23
two	27	6	1	0
no response	277	58	201	77
Other VHF transceiver				
one	76	16	22	8
two	80	17	47	18
ambiguous	0	0	0	0
no response	321	67	193	74
Other VHF transmitter				
one	39	8	11	4
two	83	17	49	19
no response	355	74	202	77

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Navigation Equipment</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
VOR/LOC receiver				
one	168	35%	34	13%
two	281	59	226	86
ambiguous	1	0	0	0
no response	27	6	2	1
VOR only receiver				
one	100	21	27	10
two	25	5	8	3
no response	352	74	227	87
Glide slope receiver				
one	227	48	137	52
two	45	9	81	31
ambiguous	1	0	0	0
no response	204	43	44	17
Report having:				
ADF	404	85	255	97
RMI	61	13	87	33
marker beacon	424	89	259	99
transponder	244	51	227	87
DME	172	36	178	68
course line computer	9	2	30	11

* Total = 477

** Total = 262

TYPE OF AIRCRAFT
PILOTED IFR MOST OFTEN

<u>Special Equipment</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Report having:				
pitot heat	426	89%	258	98%
control surface anti- or de-icing	48	10	101	39
propeller anti-icing	94	20	124	47
windshield anti-icing	57	12	98	37
weather radar	26	5	78	30
autopilot capability				
roll	241	51	192	73
pitch	177	37	163	62
altitude	124	26	149	57
approach coupler	69	14	109	42
headset mounted microphone	147	31	103	39
oxygen	134	28	129	49
cabin pressurization	14	3	45	17
other	21	4	28	11

* Total = 477

** Total = 262

HOW INSTRUMENT AIRPLANE
IS MOST OFTEN OBTAINED

<u>How Airplane Obtained</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Sole owner	83	17%	42	16%
Part owner (not club)	58	12	11	4
Club member	49	10	11	4
Borrowed	14	3	3	1
Company owned	157	33	178	68
Rent	86	18	9	3
Military	6	1	1	0
Ambiguous	24	5	7	3
No response	0	0	0	0

* Total = 477

** Total = 262

RESPONDENT INVOLVEMENT
IN AIRCRAFT SELECTION

<u>Respondent Involvement</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
None	102	21%	75	29%
Little	31	6	14	5
Some	83	17	44	17
Much	259	54	129	49
Ambiguous	0	0	0	0
No response	2	0	0	0

* Total = 477

** Total = 262

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Private Pilot Certificate</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1920-1929	2	0%	3	1%
1930-1939	25	5	5	2
1940-1944	43	9	18	7
1945-1949	58	12	34	13
1950-1954	26	5	20	8
1955-1959	61	13	29	11
1960	19	4	9	3
1961	13	3	9	3
1962	14	3	10	4
1963	22	5	7	3
1964	22	5	20	8
1965	39	8	25	10
1966	50	10	24	9
1967	30	6	20	8
1968	5	1	5	2
1969	1	0	0	0
Ambiguous	1	0	0	0
No response	46	10	24	9

* Total = 477

** Total = 262

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Commercial Pilot Certificate</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1920-1929	1	0%	1	0%
1930-1939	6	1	4	2
1940-1944	36	8	11	4
1945-1949	54	11	27	10
1950-1954	17	4	11	4
1955-1959	34	7	18	7
1960	6	1	6	2
1961	11	2	5	2
1962	12	3	5	2
1963	8	2	12	5
1964	15	3	10	4
1965	25	5	22	8
1966	47	10	30	11
1967	48	10	30	11
1968	56	12	29	11
1969	10	2	0	0
Ambiguous	0	0	0	0
No response <u>1/</u>	91	19	41	16

1/ Includes those air men who do not have the commercial pilot certificate.

* Total = 477

** Total = 262

YEAR IN WHICH ORIGINAL AIRMAN CERTIFICATE RECEIVED

<u>Received Instrument Rating</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
1930-1939	2	0%	2	1%
1940-1944	23	5	7	3
1945-1949	33	7	14	5
1950-1954	17	4	11	4
1955-1959	35	7	21	8
1960	11	2	6	2
1961	10	2	7	3
1962	11	2	6	2
1963	12	3	8	3
1964	21	4	11	4
1965	29	6	19	7
1966	55	12	37	14
1967	85	18	50	19
1968	118	25	60	23
1969	7	1	2	1
Ambiguous	1	0	0	0
No response	7	1	1	0

* Total = 477

** Total = 262

HOW INSTRUMENT RATING OBTAINED

<u>How Rating Obtained</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Completion of required FAA tests and experience	279	58%	172	66%
Graduate of approved flying school	114	24	56	21
Military competence	73	15	30	11
Ambiguous	9	2	4	2
No response	2	0	0	0

* Total = 477

** Total = 262

CERTIFICATES AND RATINGS HELD

<u>Certificates & Ratings</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Single engine	440	92%	235	90%
Multiengine	339	71	230	88
ATR ¹ / ₁	16	3	42	16
Helicopter	21	4	12	5
Flight instructor airplane	191	40	129	49
instrument	105	22	98	37
Ground instructor advanced	62	13	55	21
instrument	52	11	48	18

¹/₁ The ATR certificate was obtained by these airmen after January 1, 1969. Since most of these airmen had been ATR pilots for less than one year, they were left in the analysis.

* Total = 477

** Total = 262

FLIGHT TIME

<u>Total Time</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
200-299 hours	7	1%	0	0%
300-399	22	5	1	0
400-499	26	5	1	0
500-599	25	5	4	2
600-699	20	4	3	1
700-799	23	5	6	2
800-899	19	4	9	3
900-999	15	3	5	2
1000-1199	21	4	9	3
1200-1399	30	6	11	4
1400-1599	28	6	13	5
1600-1799	13	3	13	5
1800-1999	12	3	11	4
2000-2199	24	5	23	9
2200-2399	10	2	11	4
2400-2599	11	2	15	6
2600-2799	15	3	8	3
2800-2999	5	1	3	1
3000-3999	26	5	31	12
4000-4999	22	5	13	5
5000-5999	22	5	12	5
6000-6999	11	2	11	4
7000-7999	20	4	6	2
8000-8999	10	2	6	2
9000-9999	5	1	5	2
10000-14999	23	5	21	8
15000-19999	4	1	6	2
20000 or more	3	1	4	2
Ambiguous	0	0	0	0
No response	5	1	1	0

* Total = 477

** Total = 262

FLIGHT TIME

<u>Pilot in Command Time</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99	0	0%	0	0%
100-199	8	2	2	1
200-299	16	5	1	0
300-399	35	7	2	1
400-499	25	5	2	1
500-599	22	5	10	4
600-699	24	5	8	3
700-799	17	4	8	3
800-899	17	4	9	3
900-999	14	3	3	1
1000-1199	27	6	12	5
1200-1399	30	6	12	5
1400-1599	17	4	20	8
1600-1799	7	1	13	5
1800-1999	18	4	14	5
2000-2199	17	4	12	5
2200-2399	11	2	7	3
2400-2599	15	3	17	6
2600-2799	5	1	4	2
2800-2999	5	1	8	3
3000-3999	33	7	21	8
4000-4999	23	5	14	5
5000-5999	20	4	11	4
6000-6999	9	2	6	2
7000-7999	11	2	3	1
8000-8999	11	2	10	4
9000-9999	4	1	9	3
10000-14999	14	3	14	5
15000-19999	3	1	5	2
20000 or more	2	0	2	1
Ambiguous	0	0	0	0
No response	17	4	3	1

* Total = 477

** Total = 262

FLIGHT TIME

<u>Co-Pilot Time</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99	169	35%	85	32%
100-199	27	6	23	9
200-299	22	5	15	6
300-399	16	3	11	4
400-499	12	3	6	2
500-599	16	3	14	5
600-699	3	1	5	2
700-799	2	0	2	1
800-899	3	1	4	2
900-999	3	1	3	1
1000-1199	12	3	11	4
1200-1399	1	0	6	2
1400-1599	5	1	5	2
1600-1799	3	1	4	2
1800-1999	0	0	0	0
2000-2499	6	1	4	2
2500-2999	3	1	2	1
3000-3999	4	1	0	0
4000-4999	1	0	0	0
5000-5999	1	0	1	0
6000 or more	0	0	0	0
Ambiguous No response	168	35	61	23

* Total = 477

** Total = 262

FLIGHT TIME

<u>Total Time Last 12 Months</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19	31	6%	0	0%
20-39	28	6	1	0
40-59	49	10	3	1
60-79	47	10	7	3
80-99	15	3	3	1
100-149	67	14	15	6
150-199	35	7	13	5
200-249	45	9	17	6
250-299	20	4	15	6
300-349	35	7	18	7
350-399	13	3	15	6
400-449	17	4	20	8
450-499	4	1	14	5
500-599	20	4	31	12
600-699	11	2	23	9
700-799	9	2	13	5
800-899	8	2	16	6
900-999	4	1	3	1
1000-1099	6	1	15	6
1100-1199	3	1	7	3
1200-1299	0	0	5	2
1300-1399	0	0	3	1
1400-1499	1	0	1	0
1500 or more	1	0	3	1
Ambiguous	0	0	0	0
No response	8	2	1	0

* Total = 477

** Total = 262

HOW OFTEN THE RESPONDENTS FLY
ON THE AVERAGE

<u>Frequency</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Visual flight rules				
less than once				
per month	26	5%	7	3%
about monthly	62	13	4	2
about every other				
week	106	22	18	7
about once per week	100	21	38	15
more than once				
per week	172	36	181	69
ambiguous	3	1	0	0
no response	8	2	14	5
Instrument flight rules				
less than once				
per month	201	42	0 1/	0
about monthly	163	34	0 1/	0
about every other				
week	52	11	76	29
about once per week	29	6	62	24
more than once				
per week	21	4	124	47
ambiguous	1	0	0	0
no response	10	2	0	0

1/ Complex profile decision rule requires it to be zero.

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Total in Last 6 Months</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	68	14%	0	0%
1	8	2	1	0
2	15	3	0	0
3	13	3	0	0
4	19	4	1	0
5	15	3	1	0
6	43	9	4	2
7	21	4	2	1
8	29	6	6	2
9	13	3	4	2
10	44	9	18	7
11	8	2	1	0
12	19	4	9	3
13	3	1	1	0
14	5	1	2	1
15-19	24	5	36	14
20-24	25	5	42	16
25-29	14	3	21	8
30-34	20	4	22	8
35-39	5	1	4	2
40-44	8	2	10	4
45-49	3	1	4	2
50-54	2	0	22	8
55-59	0	0	6	2
60 or more	4	1	26	10
Ambiguous	1	0	3	1
No response	48	10	16	6

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Total in Last 12 Months</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	23	5%	0	0%
1	9	2	0	0
2	9	2	0	0
3	11	2	0	0
4	12	3	0	0
5	12	3	0	0
6	12	3	0	0
7	10	2	0	0
8	6	1	0	0
9	10	2	1	0
10	26	5	2	1
11	7	1	0	0
12	24	5	2	1
13	8	2	0	0
14	13	3	3	1
15-19	53	11	14	5
20-24	44	9	16	6
25-29	26	5	20	8
30-34	29	6	21	8
35-39	7	1	11	4
40-44	21	4	21	8
45-49	6	1	12	5
50-54	19	4	21	8
55-59	1	0	3	1
60-69	10	2	14	5
70-79	10	2	19	7
80-89	3	1	9	3
90-99	0	0	6	2
100 or more	12	3	49	19
Ambiguous	1	0	2	1
No response	43	9	16	6

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Total</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours <u>1/</u>	31	6%	1	0%
20-39 <u>1/</u>	25	5	5	2
40-59	39	8	5	2
60-79	58	12	12	5
80-99	43	9	17	6
100-119	44	9	16	6
120-139	30	6	15	6
140-159	17	4	20	8
160-179	8	2	12	5
180-199	7	1	15	6
200-219	16	3	12	5
220-239	5	1	4	2
240-259	7	1	10	4
260-279	3	1	6	2
280-299	6	1	5	2
300-399	16	3	25	10
400-499	19	4	17	6
500-599	13	3	6	2
600-699	7	1	5	2
700-799	7	1	7	3
800-899	6	1	4	2
900-999	4	1	0	0
1000 or more	20	4	26	10
Ambiguous	0	0	3	1
No response	46	10	14	5

1/ These include incorrect responses since FAR 61.35 requires a minimum of 40 hours instrument time and FAR 141.65 requires a minimum of 30 hours instrument time for instrument rating certification.

* Total = 477

** Total = 262

INSTRUMENT TIME

Actual Instrument in an Airplane in Last 6 Months	Medium Profile		Complex Profile	
	Number	% of Total*	Number	% of Total**
(1)	(2)	(3)	(4)	(5)
0 hours	89	19%	3	1%
1	37	8	2	1
2	42	9	8	3
3	34	7	4	2
4	29	6	5	2
5	24	5	11	4
6	24	5	4	2
7	6	1	0	0
8	21	4	8	3
9	5	1	2	1
10	29	6	25	10
11	1	0	4	2
12	6	1	8	3
13	1	0	2	1
14	2	0	2	1
15-19	22	5	36	14
20-24	14	3	35	13
25-29	13	3	20	8
30-34	15	3	13	5
35-39	3	1	4	2
40-44	1	0	11	4
45-49	0	0	2	1
50-54	0	0	17	6
55-59	0	0	3	1
60 or more	7	1	23	9
Ambiguous	52	11	1	0
No response			9	3

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Actual Instrument in an Airplane in Last 12 Months</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	52	11%	1	0%
1	21	4	1	0
2	37	8	0	0
3	21	4	2	1
4	19	4	1	0
5	28	6	4	2
6	25	5	2	1
7	14	3	2	1
8	14	3	6	2
9	11	2	1	0
10	20	4	7	3
11	4	1	1	0
12	12	3	4	2
13	2	0	2	1
14	7	1	4	2
15-19	30	6	18	7
20-24	29	6	23	9
25-29	14	3	18	7
30-34	15	3	21	8
35-39	5	1	9	3
40-44	16	3	25	10
45-49	6	1	10	4
50-54	10	2	13	5
55-59	0	0	3	1
60-69	5	1	11	4
70-79	6	1	11	4
80-89	2	0	11	4
90-99	1	0	7	3
100 or more	5	1	35	13
Ambiguous	2	0	1	0
No response	44	9	8	3

* Total = 477

** Total = 262

INSTRUMENT TIME

Actual Instrument in an Airplane <u>Total</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours	136	29%	15	6%
20-39	79	17	20	8
40-59	37	8	23	9
60-79	34	7	16	6
80-99	21	4	17	6
100-119	14	3	26	10
120-139	12	3	10	4
140-159	6	1	13	5
160-179	6	1	12	5
180-199	1	0	4	2
200-219	9	2	15	6
220-239	4	1	5	2
240-259	8	2	8	3
260-279	2	0	3	1
280-299	0	0	2	1
300-399	11	2	15	6
400-499	15	3	9	3
500-599	5	1	6	2
600-699	4	1	6	2
700-799	4	1	2	1
800-899	3	1	2	1
900-999	2	0	2	1
1000 or more	14	3	16	6
Ambiguous	2	0	2	1
No response	40	10	13	5

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Simulated Instrument in Last 6 Months</u>	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u>	<u>% of Total*</u>	<u>Number</u>	<u>% of Total**</u>
(1)	(2)	(3)	(4)	(5)
0 hours	130	27%	68	26%
1	26	5	14	5
2	25	5	18	7
3	33	7	10	4
4	24	5	13	5
5	30	6	30	11
6	32	7	2	1
7	11	2	2	1
8	11	2	4	2
9	2	0	2	1
10	15	3	15	6
11	2	0	1	0
12	5	1	2	1
13	1	0	1	0
14	1	0	1	0
15-19	11	2	8	3
20-24	6	1	11	4
25-29	4	1	2	1
30-34	4	1	1	0
35-39	0	0	1	0
40-44	1	0	2	1
45-49	0	0	1	0
50-54	2	0	0	0
55-59	0	0	1	0
60 or more	2	0	1	0
Ambiguous				
No response	99	21	51	19

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Simulated Instrument in Last 12 Months</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	85	18%	45	17%
1	13	3	9	3
2	23	5	20	8
3	25	5	6	2
4	26	5	2	1
5	20	4	12	5
6	17	4	9	3
7	14	3	6	2
8	19	4	8	3
9	10	2	0	0
10	29	6	31	12
11	5	1	1	0
12	28	6	8	3
13	0	0	3	1
14	3	1	0	0
15-19	21	4	14	5
20-24	21	4	15	6
25-29	2	0	5	2
30-34	7	1	6	2
35-39	4	1	1	0
40-44	5	1	3	1
45-49	0	0	4	2
50-54	5	1	1	0
55-59	0	0	1	0
60 or more	4	1	6	2
Ambiguous			0	0
No response	91	19	46	18

* Total = 477

** Total = 262

INSTRUMENT TIME

Simulated Instrument Total (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours	60	13%	24	9%
20-39	53	11	44	17
40-59	109	23	66	25
60-79	65	14	27	10
80-99	39	8	10	4
100-119	23	5	18	7
120-139	7	1	10	4
140-159	8	2	7	3
160-179	5	1	4	2
180-199	4	1	2	1
200-299	22	5	14	5
300-399	12	3	1	0
400-499	5	1	2	1
500 or more	7	1	6	2
Ambiguous			1	0
No response	58	12	26	10

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Ground Trainer</u> <u>in Last 6 Months</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	246	52%	135	52%
1	5	1	5	2
2	7	1	5	2
3	8	2	5	2
4	4	1	0	0
5	5	1	8	3
6	3	1	2	1
7	6	1	0	0
8	2	0	0	0
9	0	0	0	0
10-14	1	0	7	3
15 or more	2	0	1	0
Ambiguous	1	0	1	0
No response	187	39	93	35

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Ground Trainer in Last 12 Months</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0	216	45%	122	47%
1	9	2	6	2
2	11	2	4	2
3	8	2	2	1
4	9	2	3	1
5	7	1	9	3
6	4	1	4	2
7	5	1	2	1
8	2	0	0	0
9	0	0	2	1
10-14	11	2	12	5
15 or more	8	2	9	3
Ambiguous	1	0	0	0
No response	186	39	87	33

* Total = 477

** Total = 262

INSTRUMENT TIME

<u>Ground Trainer Total</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-19 hours	201	42%	128	49%
20-39	57	12	36	14
40-59	23	5	20	8
60-79	9	2	10	4
80-99	8	2	2	1
100-119	17	4	2	1
120-139	5	1	0	0
140-159	7	1	2	1
160-179	3	1	0	0
180-199	0	0	0	0
200-299	12	3	6	2
300-399	6	1	1	0
400-499	1	0	1	0
500 or more	4	1	2	1
Ambiguous	2	0	1	0
No response	122	26	51	19

* Total = 477

** Total = 262

WHY RESPONDENT HAS NOT BEEN PILOT IN COMMAND
IN ACTUAL INSTRUMENT WEATHER CONDITIONS IN LAST SIX MONTHS

<u>Reason Indicated</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Not applicable	267	56%	192	73%
Wasn't proficient and needed to go IFR	9	2	0	0
didn't need to go IFR	40	8	0	0
Was proficient and didn't need to go IFR	30	6	2	1
Equipment malfunction prevented going IFR	2	0	0	0
Other	42	9	3	1
Ambiguous	5	1	0	0
No response	82	17	65	25

* Total = 477

** Total = 262

LAST INSTRUMENT DUAL INSTRUCTION OR
INSTRUMENT FLYING EVALUATION RIDE

<u>Year</u>	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
<u>(1)</u>	<u>Number</u>	<u>% of</u>	<u>Number</u>	<u>% of</u>
	<u>(2)</u>	<u>Total*</u>	<u>(4)</u>	<u>Total**</u>
		<u>(3)</u>		<u>(5)</u>
Prior to 1950	3	1%	0	0%
1950-1959	14	3	2	1
1960	2	0	1	0
1961	2	0	2	1
1962	2	0	1	0
1963	8	2	1	0
1964	11	2	1	0
1965	19	4	2	1
1966	27	6	7	3
1967	42	9	10	4
1968	110	23	48	18
1969	212	44	169	65
1970	20	4	17	6
Ambiguous	1	0	0	0
No response	4	1	1	0

* Total = 477

** Total = 262

ATC FACILITIES VISITED
DURING INSTRUMENT TRAINING

<u>ATC Facilities Visited</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Air route traffic control center	226	47%	129	49%
Approach/departure control facility	289	61	174	66
Tower	349	73	209	80
None	82	17	37	14

* Total = 477

** Total = 262

ACTUAL INSTRUMENT TIME
DURING TRAINING FOR THE INSTRUMENT RATING
CONSIDERED WORTHWHILE

<u>Actual Instrument Time</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0 hours	5	1%	2	1%
1	4	1	2	1
2	16	3	7	3
3	14	3	6	2
4	14	3	3	1
5	74	16	37	14
6-9	15	3	3	1
10	111	23	71	27
11-14	1	0	0	0
15	22	5	15	6
16-19	0	0	0	0
20	45	9	32	12
21-24	0	0	0	0
25	17	4	10	4
26-29	1	0	0	0
30-39	26	5	11	4
40-49	28	6	19	7
50-59	17	4	11	4
60 or more	13	3	1	0
Ambiguous	30	6	18	7
No response	24	5	14	5

* Total = 477

** Total = 262

STATES FROM WHICH IFR FLIGHTS ORIGINATED

<u>State</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Alabama	5	1.0%	3	1.1%
Alaska	2	.4	0	0
Arizona	4	.8	1	.4
Arkansas	5	1.0	5	1.9
California	90	18.9	27	10.3
Colorado	10	2.1	3	1.1
Connecticut	5	1.0	3	1.1
Delaware	1	.2	2	.8
District of Columbia	4	.8	3	1.1
Florida	30	6.3	8	3.1
Georgia	9	1.9	4	1.5
Hawaii	0	0	0	0
Idaho	2	.4	0	0
Illinois	20	4.2	12	4.6
Indiana	10	2.1	9	3.4
Iowa	3	.6	3	1.1
Kansas	14	2.9	4	1.5
Kentucky	1	.2	5	1.9
Louisiana	5	1.0	4	1.5
Maine	0	0	1	.4
Maryland	4	.8	4	1.5
Massachusetts	7	1.5	7	2.7
Michigan	14	2.9	14	5.3
Minnesota	16	3.4	4	1.5
Mississippi	2	.4	2	.8
Missouri	10	2.1	5	1.9
Montana	2	.4	0	0
Nebraska	2	.4	4	1.5
Nevada	2	.4	0	0
New Hampshire	0	0	2	.8

* Total = 477

** Total = 262

STATES FROM WHICH IFR FLIGHTS ORIGINATED

<u>State</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
New Jersey	14	2.9%	8	3.1%
New Mexico	4	.8	4	1.5
New York	17	3.6	18	6.9
North Carolina	8	1.7	4	1.5
North Dakota	0	0	0	0
Ohio	18	3.8	19	7.3
Oklahoma	15	3.1	1	.4
Oregon	6	1.3	4	1.5
Pennsylvania	7	1.5	15	5.7
Rhode Island	1	.2	1	.4
South Carolina	3	.6	3	1.1
South Dakota	3	.6	2	.8
Tennessee	9	1.9	2	.8
Texas	39	8.2	19	7.3
Utah	2	.4	2	.8
Vermont	0	0	1	.4
Virginia	4	.8	3	1.1
Washington	14	2.9	5	1.9
West Virginia	2	.4	0	0
Wisconsin	11	2.3	6	2.3
Wyoming	0	0	1	.4
Foreign	6	1.3	3	1.1
No response	15	3.1	2	.8

* Total = 477

** Total = 262

INSTRUMENT APPROACH MOST OFTEN MADE
AT AIRPORT FROM WHICH
MOST IFR FLIGHTS ORIGINATED

<u>Type of Approach</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS	134	28%	96	37%
LOC	50	10	26	10
VOR	147	31	73	28
ADF	24	5	20	8
Radar vectors	39	8	16	6
None	48	10	16	6
Ambiguous	34	7	15	6
No response	1	0	0	0

* Total = 477

** Total = 262

TYPE OF INSTRUMENT APPROACH
MOST OFTEN MADE DURING LAST 12 MONTHS

<u>Type of Approach</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS	165	35%	159	61%
LOC	55	12	26	10
VOR	149	31	44	17
ADF	12	3	9	3
Radar vectors	42	9	11	4
None	24	5	0	0
Ambiguous	28	6	13	5
No response	2	0	0	0

* Total = 477

** Total = 262

TYPE OF FLYING
MOST OFTEN ENGAGED IN
DURING LAST 12 MONTHS

<u>Type of Flying</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
General aviation				
business				
not for hire	110	23%	67	26%
corporate pilot	32	7	68	26
air taxi or charter	31	6	45	17
aerial application	6	1	2	1
industrial/special	11	2	2	1
giving instruction	80	17	49	19
personal	184	39	16	6
Airline	3	1	2	1
Military	6	1	2	1
Ambiguous	7	1	3	1
No response	7	1	6	2

* Total = 477
** Total = 262

TYPE OF IFR FLYING
MOST OFTEN ENGAGED IN
DURING LAST 12 MONTHS

<u>Type of IFR Flying</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
General aviation				
business				
not for hire	135	28%	72	27%
corporate pilot	44	9	76	29
air taxi or charter	44	9	64	24
aerial application	0	0	0	0
industrial/special	8	2	1	0
giving instruction	55	12	29	11
personal	191	40	20	8
Airline 1/	0	0	0	0
Military 1/	0	0	0	0
Ambiguous 1/	0	0	0	0
No response 1/	0	0	0	0

1/ The definition of general aviation IFR requires it to be zero.

* Total = 477

** Total = 262

**FLIGHT INFORMATION PUBLICATIONS
USUALLY TAKEN ON AN IFR FLIGHT**

<u>Publication</u> (1)	<u>Medium</u> <u>Number</u> (2)	<u>Profile</u> <u>% of</u> <u>Total*</u> (3)	<u>Complex</u> <u>Number</u> (4)	<u>Profile</u> <u>% of</u> <u>Total**</u> (5)
Airman's Information Manual				
Part I	157	33%	96	37%
Part II	121	25	82	31
Part III	157	33	96	37
USC & GS charts				
Enroute low altitude	279	58	109	42
Enroute high altitude	17	4	15	6
Instrument approach	261	55	104	40
SIDs	120	25	53	20
Jeppesen Airway Manual Service				
Complete	116	24	117	45
Standard	82	17	44	17
Military charts	48	10	18	7
Other	30	6	19	7
Are usually current	296	62	159	61

* Total = 477

** Total = 262

FACTOR CAUSING CANCELLATION OF AN INTENDED IFR FLIGHT
JUST BEFORE PLANNED DEPARTURE DURING LAST 12 MONTHS

<u>Factor</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Had no need to cancel	182	38%	73	28%
Weather				
worse than published minimums	21	4	41	16
beyond personal limitations	94	20	21	8
beyond aircraft/ equipment capability	104	22	78	30
Equipment malfunction	20	4	10	4
Lack of adequate flight weather information and/or publications	3	1	2	1
Factors unrelated to aircraft, equipment, or weather	10	2	12	5
Other	20	4	11	4
Ambiguous	21	4	13	5
No response	2	0	1	0

* Total = 477

** Total = 262

PERSONAL WEATHER MINIMUMS

<u>ILS Personal Minimums</u> (1)	<u>Medium</u> <u>Number</u> (2)	<u>Profile</u> <u>% of</u> <u>Total*</u> (3)	<u>Complex</u> <u>Number</u> (4)	<u>Profile</u> <u>% of</u> <u>Total**</u> (5)
Ceiling				
0-99 feet	1	0%	0	0%
100-199	1	0	5	2
200-299	23	5	39	15
300-399	31	6	15	6
400-499	33	7	11	4
500-599	44	9	8	3
600-699	12	3	3	1
700-799	1	0	0	0
800-899	10	2	4	2
900-999	0	0	0	0
1000-1099	8	2	1	0
1100 or more	3	1	0	0
ambiguous	2	0	1	0
no response 1/	308	65	175	67
Visibility				
1/4 mile	6	1%	7	3%
1/2	35	7	33	13
3/4	33	7	15	6
1	82	17	26	10
1 1/4	0	0	0	0
1 1/2	7	1	1	0
1 3/4	0	0	0	0
2	21	4	6	2
ambiguous	11	2	17	6
no response	30	6	3	1
Always use published minimums 2/	187	39	143	55
Seldom make this approach 3/	65	14	11	4

1/ Includes respondents who answer 2/ or 3/

* Total = 477

** Total = 262

PERSONAL WEATHER MINIMUMS

<u>LOC Personal Minimums</u>	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
(1)	<u>Number</u>	<u>% of</u>	<u>Number</u>	<u>% of</u>
	(2)	<u>Total*</u>	(4)	<u>Total**</u>
		(3)		(5)
Ceiling				
0-99 feet	1	0%	0	0%
100-199	0	0	0	0
200-299	3	1	4	2
300-399	10	2	22	8
400-499	39	8	25	10
500-599	51	11	16	6
600-699	16	3	2	1
700-799	6	1	1	0
800-899	24	5	5	2
900-999	0	0	0	0
1000-1099	8	2	3	1
1100 or more	4	1	0	0
ambiguous	0	0	1	0
no response <u>1/</u>	315	66	183	70
Visibility				
1/4 mile	1	0%	0	0%
1/2	23	5	10	4
3/4	17	4	19	7
1	93	19	44	17
1 1/4	2	0	2	1
1 1/2	16	3	1	0
1 3/4	0	0	0	0
2	22	5	6	2
ambiguous	18	4	12	5
no response	40	8	8	3
Always use published				
minimums <u>2/</u>	178	37	155	59
Seldom make this				
approach <u>3/</u>	67	14	5	2

1/ Includes respondents who answer 2/ or 3/.

* Total = 477

** Total = 262

PERSONAL WEATHER MINIMUMS

<u>VOR Personal Minimums</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	1	0%	0	0%
100-199	0	0	0	0
200-299	2	0	0	0
300-399	3	1	7	3
400-499	15	3	18	7
500-599	55	12	25	10
600-699	22	5	9	3
700-799	7	1	1	0
800-899	30	6	6	2
900-999	3	1	0	0
1000-1099	33	7	5	2
1100 or more	6	1	0	0
ambiguous	0	0	1	0
no response 1/	300	63	190	73
Visibility				
1/4 mile	0	0%	0	0%
1/2	14	3	2	1
3/4	9	2	10	4
1	99	21	47	18
1 1/4	2	0	0	0
1 1/2	23	5	6	2
1 3/4	2	0	0	0
2	42	9	9	3
ambiguous	14	3	12	5
no response	34	7	7	3
Always use published minimums 2/	212	44	164	63
Seldom make this approach 3/	26	5	5	2

1/ Includes respondents who answer 2/ or 3/.

* Total = 477

** Total = 262

PERSONAL WEATHER MINIMUMS

<u>ADF Personal Minimums</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Ceiling				
0-99 feet	0	0%	0	0%
100-199	0	0	0	0
200-299	1	0	0	0
300-399	2	0	1	0
400-499	7	1	9	3
500-599	36	8	23	9
600-699	19	4	11	4
700-799	5	1	4	2
800-899	25	5	3	1
900-999	3	1	1	0
1000-1099	24	5	5	2
1100 or more	3	1	0	0
ambiguous	1	0	1	0
no response <u>1/</u>	351	74	204	78
Visibility				
1/4 mile	0	0%	0	0%
1/2	5	1	0	0
3/4	6	1	0	0
1	67	14	39	15
1 1/4	1	0	0	0
1 1/2	14	3	4	2
1 3/4	1	0	0	0
2	26	5	12	5
ambiguous	19	4	16	6
no response	43	9	9	3
Always use published minimums <u>2/</u>	125	26	135	52
Seldom make this approach <u>3/</u>	170	36	47	18

1/ Includes respondents who answer 2/ or 3/.

* Total = 477

** Total = 262

WEATHER GO/NO GO DECISION,
WEATHER REPORTED TO EXIST ANYWHERE ENROUTE

<u>Weather Decision</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Icing				
light				
not go	128	27%	17	6%
probably not go	131	27	34	13
probably go	143	30	92	35
go	71	15	116	44
ambiguous	0	0	2	1
no response	4	1	1	0
moderate				
not go	321	67	88	34
probably not go	97	20	66	25
probably go	40	8	64	24
go	13	3	38	15
ambiguous	1	0	1	0
no response	5	1	5	2
heavy				
not go	438	92	201	77
probably not go	28	6	36	14
probably go	2	0	15	6
go	2	0	5	2
ambiguous	3	1	2	1
no response	4	1	3	1

* Total = 477

** Total = 262

WEATHER GO/NO GO DECISION,
WEATHER REPORTED TO EXIST ANYWHERE ENROUTE

<u>Weather Decision</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Thunderstorms				
scattered				
not go	26	5%	8	3%
probably not go	63	13	16	6
probably go	227	48	93	35
go	153	32	142	54
ambiguous	0	0	2	1
no response	8	2	1	0
broken				
not go	92	19	33	13
probably not go	131	38	67	26
probably go	143	30	88	34
go	46	10	66	25
ambiguous	0	0	2	1
no response	15	3	6	2
lines				
not go	308	65	129	49
probably not go	117	25	69	26
probably go	34	7	41	16
go	11	2	22	8
ambiguous	0	0	1	0
no response	7	1	0	0
Heavy ground fog				
not go	213	45	64	24
probably not go	69	14	48	18
probably go	109	23	79	30
go	79	17	67	26
ambiguous	0	0	0	0
no response	7	1	4	2

* Total = 477

** Total = 262

DECISION TO FILE AN IFR FLIGHT PLAN
BEFORE DEPARTURE DURING THE DAYTIME
BY DESTINATION WEATHER FORECAST

<u>Decision to File IFR</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Good VFR <u>1/</u>				
almost never	169	35%	63	24%
seldom	143	30	56	21
often	101	21	76	29
almost always	56	12	66	25
never had experience	5	1	1	0
ambiguous	0	0	0	0
no response	3	1	0	0
VFR <u>2/</u>				
almost never	65	14	8	3
seldom	96	20	25	10
often	152	32	72	27
almost always	157	33	155	59
never had experience	5	1	1	0
ambiguous	0	0	1	0
no response	2	0	0	0
IFR <u>3/</u>				
almost never	21	4	0	0
seldom	31	6	3	1
often	27	6	13	5
almost always	362	76	243	93
never had experience	30	6	1	0
ambiguous	2	0	1	0
no response	4	1	1	0

1/ ceiling better than 5000 ft., visibility better than 5 miles.

2/ ceiling 1000 to 5000 ft., visibility 3 to 5 miles.

3/ ceiling less than 1000 ft., visibility less than 3 miles.

* Total = 477

** Total = 262

DECISION TO CANCEL AN IFR FLIGHT PLAN
AS SOON AS REACHING VFR CONDITIONS
AFTER DEPARTING AN AIRPORT IN IFR WEATHER

<u>Decision to Cancel</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	145	30%	112	43%
Seldom	136	29	97	37
Often	122	26	36	14
Almost always	47	10	16	6
Never had experience	25	5	1	0
Ambiguous	0	0	0	0
No response	2	0	0	0

* Total = 477

** Total = 262

DECISION TO FILE AN IFR FLIGHT PLAN
BEFORE DEPARTING ON A FLIGHT
TO BE CONDUCTED ENTIRELY DURING THE DAYTIME
IN GOOD VFR CONDITIONS

<u>Decision to File</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	130	27%	47	18%
Seldom	168	35	73	28
Often	122	26	91	35
Almost always	45	9	50	19
Never had experience	9	2	0	0
Ambiguous	0	0	0	0
No response	3	1	1	0

* Total = 477

** Total = 262

DECISION TO FILE AN IFR FLIGHT PLAN
IN FLIGHT

<u>Decision to File</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Almost never	96	20%	29	11%
Seldom	221	46	129	49
Often	120	25	99	38
Almost always	8	2	3	1
Never had experience	31	6	1	0
Ambiguous	0	0	1	0
No response	1	0	0	0

* Total = 477

** Total = 262

AVERAGE PERCENT OF TIME ON INSTRUMENT FLIGHT PLANS
IN ACTUAL INSTRUMENT CONDITIONS

<u>Percent</u> (1)	<u>Medium</u> <u>Number</u> (2)	<u>Profile</u> <u>% of</u> <u>Total*</u> (3)	<u>Complex</u> <u>Number</u> (4)	<u>Profile</u> <u>% of</u> <u>Total**</u> (5)
0-4	31	6%	5	2%
5-9	52	11	20	8
10-14	38	18	56	21
15-19	37	8	21	8
20-24	62	13	45	17
25-29	35	7	23	9
30-34	41	9	31	12
35-39	3	1	1	0
40-44	15	3	8	3
45-49	0	0	4	2
50-54	51	11	19	7
55-59	0	0	0	0
60-64	4	1	7	3
65-69	2	0	2	1
70-74	11	2	1	0
75-79	9	2	4	2
80-84	8	2	3	1
85-89	2	0	0	0
90-94	9	2	2	1
95-100	4	1	2	1
Ambiguous	7	1	5	2
No response	6	1	3	1

* Total = 477

** Total = 262

**ACTUAL INSTRUMENT APPROACH
MADE DURING LAST 12 MONTHS**

<u>Actual Instrument Approach</u> (1)	<u>Medium Profile Number</u> (2)	<u>% of Total*</u> (3)	<u>Complex Profile Number</u> (4)	<u>% of Total**</u> (5)
Was an approach made?				
yes	348	73%	262	100%
no	114	24	0 <u>2/</u>	0
ambiguous	0	0	0 <u>2/</u>	0
no response	15	3	0 <u>2/</u>	0
Lowest type of approach made				
ILS	156	33	192	73
LOC	51	11	21	8
VOR	74	16	20	8
ADF	20	4	1	0
Radar	28	6	11	4
ambiguous	29	6	15	6
no response <u>1/</u>	119	25	2	1

1/ The respondents who did not have to make an actual instrument approach in the last 12 months were asked not to answer this part of the question.

2/ Complex profile decision rule requires it to be zero.

* Total = 477

** Total = 262

LOWEST ACTUAL INSTRUMENT APPROACH
MADE IN THE LAST 12 MONTHS

<u>Lowest Approach Made</u>	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
		% of		% of
<u>(1)</u>	<u>Number</u>	<u>Total*</u>	<u>Number</u>	<u>Total**</u>
	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>
Ceiling				
0-99 feet	2	0%	3	1%
100-199	5	1	13	5
200-299	49	10	114	44
300-399	41	9	31	12
400-499	48	10	40	15
500-599	52	11	12	5
600-699	35	7	11	4
700-799	17	4	9	3
800-899	40	8	6	2
900-999	10	2	3	1
1000-1099	23	5	1	0
1100 or more	11	2	2	1
ambiguous	8	2	4	2
no response 1/	136	29	13	5
Visibility				
1/4 mile	16	3	21	8
1/2	74	16	122	47
3/4	45	9	43	16
1	116	24	50	19
1 1/4	11	2	3	1
1 1/2	35	7	8	3
1 3/4	3	1	0	0
2	56	12	10	4
ambiguous	1	0	1	0
no response 1/	120	25	4	2

1/ The respondents who did not have to make an actual instrument approach in the last 12 months were asked not to answer this part of the question.

* Total = 477

** Total = 262

RADIUS FROM HOME AIRPORT
MOST OFTEN OFFITE IFR

<u>Radius</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99 nm	52	11%	21	8%
100-199	91	19	35	13
200-299	94	20	35	13
300-399	80	17	44	17
400-499	31	6	23	9
500-599	48	10	43	16
600-699	16	3	11	4
700-799	5	1	3	1
800-899	9	2	7	3
900-999	2	0	1	0
1000-1499	23	5	20	8
1500-1999	5	1	7	3
2000-2499	0	0	4	2
2500-2999	1	0	1	0
3000 or more	2	0	0	0
Ambiguous	1	0	2	1
No response	17	4	5	2

* Total = 477

** Total = 262

ONE WAY DISTANCE OF LONGEST NONSTOP FLIGHT
ON AN IFR FLIGHT PLAN AS PILOT IN COMMAND
DURING LAST 12 MONTHS

<u>Distance</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
0-99 nm	60	13%	1	0%
100-199	61	13	8	3
200-299	67	14	25	10
300-399	62	13	38	15
400-499	62	13	20	8
500-599	32	7	32	12
600-699	47	10	24	9
700-799	18	4	27	10
800-899	18	4	23	9
900-999	9	2	14	5
1000-1499	13	3	33	13
1500-1999	2	0	7	3
2000-2499	3	1	6	2
2500-2999	0	0	1	0
3000 or more	2	0	1	0
Ambiguous	0	0	1	0
No response	21	4	1	0

* Total = 477

** Total = 262

NUMBER OF TIMES HELD OR EXECUTED MISSED APPROACH
DURING LAST 12 MONTHS

<u>Number of Times</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Had to hold				
0	249	52%	0 <u>1/</u>	0%
1	60	13	32	12
2	63	13	45	17
3	23	5	31	12
4	9	2	15	6
5-9	23	5	53	20
10-14	8	2	38	15
15-19	4	1	11	4
20-24	1	0	10	4
25 or more	5	1	13	5
Ambiguous	6	1	14	5
No response	26	5	0	0

Had to execute a missed approach

0	374	78%	136	52%
1	44	9	53	20
2	14	3	30	11
3	2	0	11	4
4	1	0	4	2
5-9	2	0	12	5
10-14	0	0	5	2
15-19	0	0	0	0
20-24	0	0	0	0
25 or more	0	0	1	0
Ambiguous	1	0	1	0
No response	39	8	9	3

1/ Complex profile decision rule requires it to be zero.

* Total = 477

** Total = 262

NUMBER OF TIMES REROUTED OR DIVERTED TO ALTERNATE
DURING LAST 12 MONTHS

<u>Number of Times</u> (1)	<u>Medium</u>	<u>Profile</u>	<u>Complex</u>	<u>Profile</u>
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Rerouted				
0	173	36%	24	9%
1	77	16	12	5
2	58	12	24	9
3	36	8	20	8
4	20	4	14	5
5-9	46	10	49	19
10-14	21	4	43	16
15-19	3	1	6	2
20-24	3	1	15	6
25 or more	2	0	27	10
Ambiguous	11	2	22	8
No response	27	6	6	2

Had to divert to an alternate

0	388	81%	143	55%
1	44	9	54	21
2	10	2	31	12
3	1	0	6	2
4	1	0	1	0
5-9	0	0	11	4
10-14	0	0	2	1
15-19	0	0	1	0
20-24	0	0	0	0
25 or more	0	0	0	0
Ambiguous	2	0	2	1
No response	31	6	11	4

* Total = 477

** Total = 262

DIFFICULTY OF INSTRUMENT APPROACHES

<u>Difficulty Rating</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
ILS				
little	293	61%	210	80%
some	101	21	33	13
much	15	3	4	2
extreme	7	1	1	0
seldom make	56	12	11	4
ambiguous	0	0	1	0
no response	5	1	2	1
LOC				
little	254	53	210	80
some	128	27	36	14
much	12	3	3	1
extreme	1	0	1	0
seldom make	76	16	8	3
ambiguous	1	0	1	0
no response	5	1	3	1
VOR				
little	314	66	239	80
some	130	27	42	16
much	10	2	3	1
extreme	1	0	1	0
seldom make	15	3	4	2
ambiguous	3	1	1	0
no response	4	1	2	1
ADF				
little	80	17	49	19
some	147	31	127	48
much	73	15	28	11
extreme	14	3	5	2
seldom make	149	31	45	17
ambiguous	9	2	5	2
no response	5	1	3	1

* Total = 477

** Total = 262

ASSISTANCE RECEIVED BY PILOT IN COMMAND
DURING AN IFR FLIGHT

<u>Assistance Received</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Frequency of assistance				
almost never	183	38%	100	38%
seldom	130	27	62	24
often	102	21	43	16
almost always	60	13	56	21
ambiguous	0	0	0	0
no response	2	0	1	0
Nature of assistance				
by another pilot				
yes	293	61	184	70
no	95	20	29	11
ambiguous	0	0	0	0
no response	89	19	49	19
instrument rated				
yes	174	36	150	57
no	200	42	59	23
ambiguous	1	0	0	0
no response	102	21	53	20
required co-pilot				
yes	40	8	81	31
no	337	71	134	51
ambiguous	0	0	0	0
no response	100	21	47	18

* Total = 477

** Total = 262

SINGLE ENGINE AIRCRAFT EXPERIENCE

<u>Single Engine Experience</u> (1)	<u>Medium</u> <u>Number</u> (2)	<u>Profile</u> % of <u>Total*</u> (3)	<u>Complex</u> <u>Number</u> (4)	<u>Profile</u> % of <u>Total**</u> (5)
Actual IFR				
yes	454	95%	247	94%
no	21	4	13	5
ambiguous	0	0	0	0
no response	2	0	2	1
Night VFR				
yes	455	95	255	97
no	11	2	5	2
ambiguous	0	0	0	0
no response	11	2	2	1
Night actual IFR				
yes	295	62	187	71
no	171	36	73	28
ambiguous	1	0	0	0
no response	10	2	2	1

* Total = 477

** Total = 262

ADEQUACY OF 6 HOURS OF INSTRUMENT EXPERIENCE
WITHIN PRECEDING 6 CALENDAR MONTHS
IN MAINTAINING A SAFE LEVEL OF INSTRUMENT PROFICIENCY

<u>Adequacy</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Not adequate	154	32%	123	47%
Adequate	295	62	127	48
More than adequate	25	5	11	4
Ambiguous	0	0	0	0
No response	3	0	1	0

* Total = 477

** Total = 262

RESPONDENT SELF EVALUATION
OF AERONAUTICAL
SKILL, KNOWLEDGE, EXPERIENCE

<u>Self Evaluation</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Skill level				
1	17	4%	2	1%
new instrument pilot	54	11	5	2
3	142	30	24	9
4	152	32	78	30
professional pilot	96	20	132	50
6	10	2	19	7
ambiguous	0	0	0	0
no response	6	1	2	1
Knowledge level				
1	7	1	2	1
new instrument pilot	42	9	4	2
3	98	21	23	9
4	167	35	54	21
professional pilot	134	28	152	58
6	23	5	25	10
ambiguous	0	0	0	0
no response	6	1	2	1
Experience level				
1	23	5	2	1
new instrument pilot	72	15	3	1
3	161	34	54	21
4	107	22	74	28
professional pilot	83	17	107	41
6	25	5	19	7
ambiguous	0	0	1	0
no response	6	1	2	1

* Total = 477

** Total = 262

DIFFICULTY OF IFR FLIGHT
Medium Profile

Departure Phase IFR Condition (1)	Frequency of Encounter					
	never (2)	almost never (3)	seldom (4)	often (5)	ambig- uous (6)	no response (7)
normal <u>1/</u>	24	26	90	238	2	97
minimum ceiling and/or visibility	47	110	217	81	1	21
light or moderate icing	172	153	97	22	2	31
light or moderate turbulence	42	82	206	119	1	27
scattered or broken thunderstorms	96	127	160	66	1	27
strong winds	53	95	191	110	1	27
nonroutine ATC instructions	77	138	187	42	2	31

Departure Phase IFR Condition (8)	Difficulty					
	little (9)	some (10)	much (11)	extreme (12)	ambig- uous (13)	no response (14)
normal <u>L</u>	320	23	1	0	2	131
minimum ceiling and/or visibility	268	118	9	1	1	80
light or moderate icing	120	114	28	8	2	205
light or moderate turbulence	191	179	21	2	1	83
scattered or broken thunderstorms	114	178	42	7	1	135
strong winds	198	158	28	2	1	90
nonroutine ATC instructions	165	167	25	5	1	114

1/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Complex Profile

Departure Phase IFR Condition (1)	Frequency of Encounter					
	never (2)	almost never (3)	seldom (4)	often (5)	ambig- uous (6)	no response (7)
normal <u>L</u> / minimum ceiling and/or visibility	2	4	27	161	2	66
light or moderate icing	4	29	139	83	0	7
light or moderate turbulence	32	71	111	39	0	9
scattered or broken thunderstorms	1	22	145	88	0	6
strong winds	26	61	108	58	1	8
nonroutine ATC instructions	7	27	128	89	0	11
	22	65	121	44	0	10

<u>Departure Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal <u>L</u> / minimum ceiling and/or visibility	173	4	0	0	1	84
light or moderate icing	191	42	1	0	0	28
light or moderate turbulence	124	70	11	2	1	54
scattered or broken thunderstorms	142	88	7	0	0	25
strong winds	90	103	15	3	0	51
nonroutine ATC instructions	151	78	3	0	0	30
	143	66	10	2	0	41

L/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Medium Profile

<u>Transition Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal <u>L</u>	20	31	90	230	1	105
minimum ceiling and/or visibility	45	91	196	109	1	35
light or moderate icing	128	146	134	33	2	34
light or moderate turbulence	34	78	199	129	3	34
scattered or broken thunderstorms	76	130	174	61	2	34
strong winds	46	79	208	112	2	30
nonroutine ATC instructions	76	133	192	42	1	33

<u>Transition Phase IFR Condition</u> (8)	<u>Difficulty</u>					<u>no response</u> (14)
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	
normal <u>L</u>	299	31	1	0	1	145
minimum ceiling and/or visibility	277	90	10	0	2	98
light or moderate icing	135	134	33	4	2	169
light or moderate turbulence	191	181	20	1	1	83
scattered or broken thunderstorms	110	182	50	7	1	127
strong winds	196	163	24	0	1	93
nonroutine ATC instructions	185	144	26	5	1	116

1/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Complex Profile

<u>Transition Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal I/ minimum ceiling and/or visibility	2	4	29	154	0	73
light or moderate icing	9	23	133	83	0	14
light or moderate turbulence	20	68	117	43	0	14
scattered or broken thunderstorms	3	25	135	84	0	15
strong winds	19	61	106	64	0	12
nonroutine ATC instructions	3	26	134	86	0	13
	23	62	116	41	0	20

<u>Transition Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal I/ minimum ceiling and/or visibility	171	7	0	0	0	84
light or moderate icing	195	26	2	0	0	39
light or moderate turbulence	128	75	11	1	0	47
scattered or broken thunderstorms	146	78	6	0	0	32
strong winds	98	103	13	1	0	47
nonroutine ATC instructions	161	63	6	0	0	32
	153	46	9	2	0	52

I/ Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Medium Profile

<u>Approach Phase IFR Condition</u> (1)	<u>Frequency of Encounter</u>					
	<u>never</u> (2)	<u>almost never</u> (3)	<u>seldom</u> (4)	<u>often</u> (5)	<u>ambig- uous</u> (6)	<u>no response</u> (7)
normal \checkmark	21	25	90	229	1	111
minimum ceiling and/or visibility	43	126	207	67	2	32
light or moderate icing	157	152	110	18	1	39
light or moderate turbulence	41	95	210	92	2	37
scattered or broken thunderstorms	112	147	149	33	1	35
strong winds	43	98	216	85	1	34
nonroutine ATC instructions	87	146	167	40	1	36

<u>Approach Phase IFR Condition</u> (8)	<u>Difficulty</u>					
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	<u>no response</u> (14)
normal \checkmark	1	283	37	1	1	155
minimum ceiling and/or visibility	195	172	19	2	1	88
light or moderate icing	120	125	33	6	1	192
light or moderate turbulence	152	197	35	1	2	90
scattered or broken thunderstorms	114	150	51	4	1	157
strong winds	142	198	43	3	2	89
nonroutine ATC instructions	146	156	44	7	1	123

\checkmark Does not include any of the conditions which follow normal.

DIFFICULTY OF IFR FLIGHT
Complex Profile

Approach Phase IFR Condition (1)	Frequency of Encounter					
	never (2)	almost never (3)	seldom (4)	often (5)	ambig- uous (6)	no response (7)
normal <u>L</u> / minimum ceiling and/or visibility	2	5	27	159	0	69
light or moderate icing	3	34	136	75	0	14
light or moderate turbulence	31	70	115	32	0	14
scattered or broken thunderstorms	3	33	134	80	0	12
strong winds	25	66	120	35	0	16
nonroutine ATC instructions	3	38	136	70	0	15
	25	68	112	35	0	22

<u>Approach Phase IFR Condition</u> (8)	<u>Difficulty</u>					<u>no response</u> (14)
	<u>little</u> (9)	<u>some</u> (10)	<u>much</u> (11)	<u>extreme</u> (12)	<u>ambig- uous</u> (13)	
normal <u>L</u> / minimum ceiling and/or visibility	161	10	0	0	0	91
light or moderate icing	149	71	8	0	0	34
light or moderate turbulence	116	73	10	2	0	61
scattered or broken thunderstorms	124	97	11	0	0	30
strong winds	81	104	20	3	0	54
nonroutine ATC instructions	115	104	14	2	0	27
	130	63	13	0	0	56

L/ Does not include any of the conditions which follow normal.

ASPECT OF FLYING PERFORMANCE WHICH DETERIORATES FIRST
AS A "NORMAL" IFR FLIGHT BECOMES MORE DIFFICULT
BECAUSE OF IFR CONDITIONS

<u>Aspect of Performance Deteriorating First</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Altitude control	62	13%	41	16%
Heading control	122	26	71	27
Communications	66	14	22	8
Accurate use of enroute & approach charts, etc.	75	16	28	11
Accurately remembering ATC instructions	69	14	24	9
Accurate interpretation of instrument readings	29	6	9	3
Other	32	7	43	16
Ambiguous	11	2	9	3
No response	11	2	15	6

* Total = 477

** Total = 262

REASON FOR FLYING PERFORMANCE DETERIORATION

<u>Reason</u> (1)	<u>Medium Profile</u>		<u>Complex Profile</u>	
	<u>Number</u> (2)	<u>% of Total*</u> (3)	<u>Number</u> (4)	<u>% of Total**</u> (5)
Lack of actual instrument flying experience	90	19%	22	8%
Unfamiliarity with ATC instructions	14	3	5	2
Difficulty in staying current on latest procedures and information	32	7	9	3
Not enough time to anticipate future tasks	50	10	36	14
Lack of recent instrument flying practice	159	33	37	14
Other	111	23	122	47
Ambiguous	6	1	3	1
No response	15	3	28	11

* Total = 477

** Total = 262

REPORTED MOST COMMON ERROR MADE BY INSTRUMENT PILOTS

Most Common Error (1)	Medium Profile % of Total*		Complex Profile % of Total**	
	Number (2)	Total* (3)	Number (4)	Total** (5)
Not knowing personal limitations	84	18%	35	13%
Not planning ahead	74	16	45	17
Allowing skills to deteriorate	40	8	23	9
Misunderstanding ATC instructions	44	9	17	6
Poor instrument scanning	30	6	18	7
Confidence in being able to handle weather	28	6	16	6
Altitude control	12	3	10	4
Not understanding weather	13	3	8	3
Heading control	8	2	12	5
Flying IFR with inadequate equipment	17	4	3	1
Poor communications technique	10	2	8	3
Allowing knowledge to deteriorate	7	1	9	3
Inaccurate use of charts and publications	7	1	5	2
Not scanning for traffic	8	2	3	1
Unclassified	51	11	36	14
None or no response	44	9	14	5

* Total = 477

** Total = 262

CHANGES SUGGESTED IN THE TRAINING AND REGULATIONS
CONCERNING CERTIFICATION OF NEW INSTRUMENT PILOTS

Suggested Change (1)	Medium Profile		Complex Profile	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
Require actual instrument experience	162	34%	93	35%
Require more time before certification	22	5	17	6
Require more simulated instrument	18	4	10	4
Recertify or periodically check instrument pilots	9	2	13	5
Set higher instructional standards	12	3	7	3
More emphasis on instrument approach	12	3	4	2
Issue different categories of instrument ratings	8	2	7	3
More emphasis on ATC procedures	6	1	6	2
More comprehensive flight check	6	1	6	2
More cross country experience	7	1	4	2
More practical and/or realistic written exam	7	1	4	2
Require flight simulator experience	8	2	2	1
Unclassified	80	17	48	18
None or no response	120	25	41	16

* Total = 477

** Total = 262

REPORTED MOST UNCOMFORTABLE OR THREATENING EXPERIENCE
DURING AN IFR FLIGHT IN ACTUAL IFR CONDITIONS

Experience (1)	Medium Profile		Complex Profile	
	Number (2)	% of Total* (3)	Number (4)	% of Total** (5)
Structural icing	128	27%	84	32%
Thunderstorms	48	10	43	16
Turbulence	30	6	11	4
Communications loss	24	5	14	5
Equipment malfunction	26	5	12	5
Engine failure	12	3	16	6
Feeling behind a situation	22	5	3	1
Deteriorating weather	19	4	1	0
Approach to minimums	10	2	10	4
Spatial disorientation	14	3	5	2
Loss of navigation equipment	12	3	6	2
Near midair and/or unknown traffic	12	3	6	2
Loss of primary flight instruments	8	2	5	2
Communications and navigation loss	8	2	5	2
Unclassified	61	13	32	12
None or no response	43	9	9	3

* Total = 477

** Total = 262

FEDERAL AVIATION REGULATIONS CONCERNING
INSTRUMENT RATING CERTIFICATION

§ 61.35 Instrument rating: knowledge and experience requirements.

(a) An applicant for an instrument rating must hold at least—

- (1) A commercial pilot certificate; or
- (2) A private pilot certificate and meet the requirements of § 61.115(a) except [subparagraph (3)] thereof. However, in the case of a helicopter instrument rating the applicant must hold at least a private pilot certificate and meet the requirements of § 61.119 in a helicopter.

(b) An applicant for an instrument rating must pass a written test on—

- (1) This subchapter as it applies to flight under IFR conditions;
- (2) Radio navigation systems and procedures, instrument landing systems and procedures, and radio communications procedures; and
- (3) Meteorology, including the characteristics of air masses and fronts and the weather associated with them, elementary principles of forecasting, and the availability, evaluation, and utilization of meteorological reports.

(c) An applicant for an instrument rating must have at least 40 hours of instrument time under actual or simulated conditions, including time acquired in a synthetic trainer. That time must include at least 20 hours of flight time of which at least 15 hours must be instrument flight instruction given by a flight instructor with an appropriate instrument rating on his flight instructor certificate. In the case of an applicant for an instrument rating for an aircraft other than a helicopter, at least 10 hours of the required 20 hours of flight time and at least 5 hours of the required 15 hours of instrument flight instruction must be accomplished in an aircraft other than a helicopter. In the case of an applicant for a helicopter instrument rating, at least 10 hours of the required 20 hours of flight and at least 5 hours of the required 15 hours

of instrument flight instruction must be accomplished in a helicopter. The required instrument flight instruction must include at least—

- (1) An instrument approach down to the published minimums at two different locations, at least one of which must have a VOR or ILS facility that is used for the approach;
- (2) Two instrument approaches made in accordance with a clearance from air traffic control and including transition from en route airways instrument flight to the approach fix or facility from which the approach will begin; and
- (3) One flight with an aircraft other than a helicopter of at least 200 nautical miles on Federal airways while operating in accordance with an approved IFR flight plan except that in the case of an applicant for a helicopter instrument rating that flight must be accomplished with a helicopter for a distance of at least 50 nautical miles.

The flight required by subparagraph (3) of this paragraph must include at least two compulsory reporting points and use VHF navigation facilities for at least one leg of the course. During the flight at least one instrument approach must be made down to the published minimums, at a place where the trainee has not previously made an instrument approach.

§ 61.27 Instrument rating: skill requirements.

(a) An applicant for an instrument rating must pass a practical test on the procedures and maneuvers listed in paragraph (c) of this section. The test is given in three phases, an oral operational test, an instrument flying test, and a radio navigation and approach procedures test. The applicant must perform the flight maneuvers solely by reference to instruments.

(b) Any significant error of a dangerous nature is disqualifying. Any error that makes it necessary for the examiner to take over the controls to avoid violating the aircraft's operating limitations, a loss of control, or a collision with the ground is disqualifying.

(c) The applicant must perform the following procedures and maneuvers competently:

(1) *Phase I—oral operational test:*

- (i) Instrument flight planning.
- (ii) Preparing and filing an instrument flight plan.
- (iii) Aircraft performance, range, and fuel requirements.

(iv) Required instruments and equipment, and their proper use.

(2) *Phase II—instrument flying test:*

- (i) Straight and level flight, using needle, ball, and airspeed only.
- (ii) Turns, climbs, and descents, using needle, ball, and airspeed only.
- (iii) Stalls and maneuvering at approach speeds, except that stalls are not required for helicopters.
- (iv) Steep turns.
- (v) Recovery from unusual attitudes, using needle, ball, and airspeed only.
- (vi) Engine-out procedures, if test is in multiengine aircraft.

(3) *Phase III—radio navigation and approach procedures test:*

(i) Radio navigation, including orientation using LF, OMNI range, or ADF.

(ii) Using radio for voice communication.

(iii) Standard instrument approach to authorized IFR weather minimums (not more than 500 feet and 1 mile), including holding procedures.

(iv) Missed approach procedures.

(v) Emergencies, such as radio or instrument malfunctions.

(vi) Compliance with air traffic control instructions and procedures.

§ 61.115 Airplane rating: aeronautical experience.

(a) *Flight time.* An applicant for a commercial pilot certificate (airplane) must have at least 200 hours of flight time, including at least—

(1) 100 hours of flight time in powered aircraft, including 50 hours in airplanes of which at least 15 hours were solo;

(2) 100 hours of flight time as pilot in command, including—

(i) 50 hours of cross-country, each flight including a landing more than 25 miles from the place of departure;

(ii) Takeoffs and landings from at least two different airports under two-way radio instruction from an airport control tower; and

(iii) One cross-country flight of at least 350 miles including landings at three points, one of which is at least 150 miles from the place of departure;